# Venture Capital Climate for Bioscience in Maryland

**A Comparative Study of Biotechnology Venture Capital Funding and State Funding Initiatives in Maryland and Selected Other States**

**By**


**Commissioned by**


**MdBio, Inc.**

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## EXECUTIVE SUMMARY

### Background

Maryland has a significant biotechnology industry. The state's industry is the third-largest in the country, ranked by number of companies (behind California and Massachusetts). On a per capita basis, Maryland's biotechnology industry ranks second in the country, behind only Massachusetts. However, some have observed that companies in Maryland do not seem to be involved in as many venture capital deals as might be expected for an industry of that size.

Ernst & Young LLP was engaged by MdBio, Inc. to:

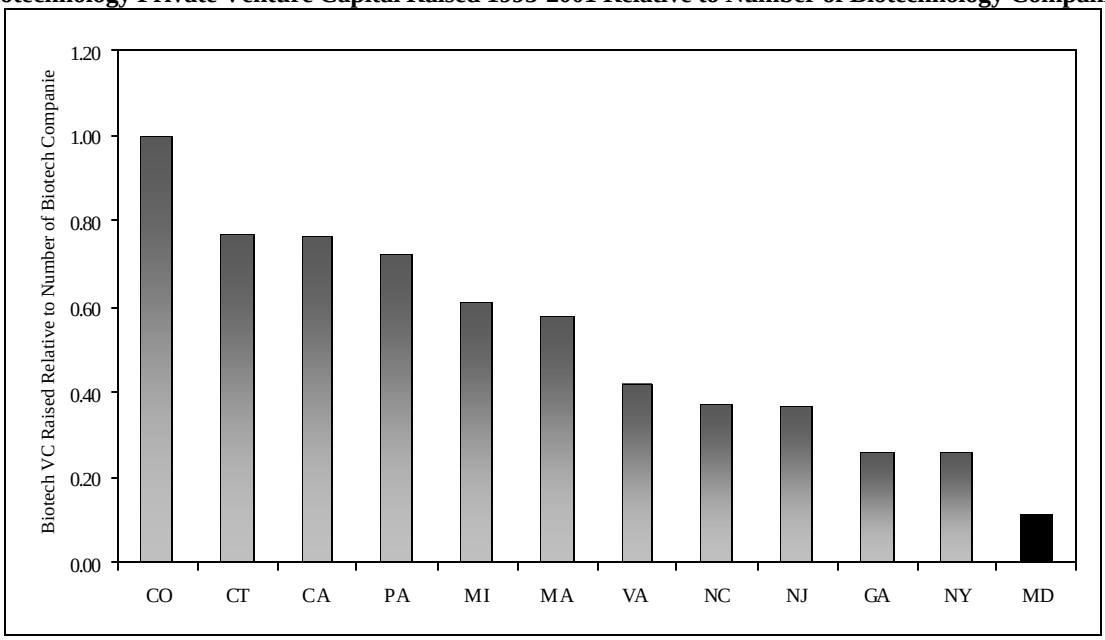
- benchmark the venture capital climate for bioscience companies in Maryland compared to several other selected states;
- investigate whether Maryland has a venture capital gap for bioscience companies; and
- suggest recommendations for Maryland to close any funding gap based on good practices in other states.

### Findings

The main findings of this study are:

- The Maryland bioscience industry has a private venture capital funding gap of approximately $50 to 100 million per year, as compared to private venture capital financings of biotechnology companies in other selected states. In spite of the presence of a large number of companies, Maryland ranks last in venture capital relative to the number of biotechnology companies in each state (See Exhibit below).

**Biotechnology Private Venture Capital Raised 1995-2001 Relative to Number of Biotechnology Companies**



- The funding gap appears to exist for all funding amounts, though the gap appears most prominent in situations where companies are seeking larger financing amounts, such as those in excess of $3 million.
- The funding gap in private venture capital raised by Maryland biotechnology companies is not being closed by current state government funding programs – there is a funding gap even after including investments made by state programs.
- It should be noted that the estimated venture funding gap is based on a conservative definition of biotechnology companies, focusing only on Maryland companies that are appropriate candidates for venture capital funding.

Recommendations

Maryland may consider undertaking public initiatives to close the perceived gap in private venture funding of biotechnology companies, including:

- *A Bioscience-Focused Venture Capital Program*: Maryland's government-supported venture capital investments are not specific to Maryland bioscience companies. A greater focus on bioscience investments, either through increasing the funding of and expanding the scope of existing programs, such as the Challenge and Enterprise programs of the Maryland Department of Business and Economic Development (DBED) or through the creation of a new state-supported bioscience venture capital fund, could help increase the industry's share of venture capital raised by Maryland companies.

- *Greater Private Sector Involvement in Venture Capital Funding*: A new biotechnology-specific venture capital program could be created which would be partially funded with state money and by other private sector participants. Private sector involvement increases the accountability of the recipient and increases the value of each taxpayer dollar invested.

- *Tobacco Settlement Money*: States such as Georgia, Michigan and Pennsylvania have allocated a portion of the funds received in settlements of lawsuits against the tobacco companies, ranging from 1.4 to 11 percent of total available funds, to biotech-related activities. If Maryland were to allocate five percent of its tobacco money to an investment in biotechnology venture capital, the state's biotech companies could have access to more than $200 million in additional funding.

- *Public Pension Money*: The State Retirement and Pension System of Maryland has invested 0.02 percent of total assets under management in venture capital funds. The California Public Employees' Retirement System (CalPERS), on the other hand, has invested about 1.2 percent of its assets under management in venture capital funds. If the Maryland pension system invested one percent of its assets under management in venture capital funds and allocated half that amount to biotechnology focused funds, the state's biotech companies could have access to $150 million in funding.

This study analyzes the venture capital climate in Maryland relative to other states based on publicly available information. The recommendations made are based upon information obtained regarding the observed practices in Maryland and in other states. The recommendations do not address the legal issues related to the implementation of proposed initiatives, the return on investment, the advisability of alternative uses of public money, or the economic impact of these initiatives on Maryland.

The report is organized as follows: Section I provides an introduction to biotechnology financing; Section II benchmarks the venture capital climate in Maryland as compared to selected other states and analyzes the venture funding gap in Maryland; Section III provides recommendations that may be considered in order to close the funding gap relative to other states; and Section IV provides details about the venture funding environment and state funding programs in Maryland and the other states analyzed.

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## I. INTRODUCTION: BIOTECHNOLOGY, FINANCING AND VENTURE CAPITAL

The Biotechnology Industry Organization ("BIO") defines biotechnology as "the use of the cellular and molecular processes to solve problems or make products." This is a broad definition of the industry that includes organizations using cells and biological molecules for applications in medicine, agriculture and environmental management. This study, however, defines the industry more narrowly, focusing primarily on medical biotechnology companies, rather than those engaged in agricultural or environmental biotechnology. It also focuses on companies engaged in research-driven drug discovery rather than those providing related services such as contract research and manufacturing. In various places, the report uses the terms biotechnology, bioscience and biopharmaceuticals interchangeably.

Biotechnology companies can be broadly divided into those engaged in research-driven drug discovery and those providing bioscience services. Though related, these two types of companies are fundamentally different from an investor's viewpoint. Research-driven drug discovery companies undertake enormous risks in the anticipation of large potential payoffs if they are able to successfully discover and commercialize products in a profitable fashion. At present, the majority of these companies do not have profits or even significant revenues. Services companies, on the other hand, undertake none of the enormous risks and capital investments associated with the drug discovery process.

The vast majority of biotechnology companies are privately-held and must raise capital from sources other than the public capital markets. The investment needs of these companies are commonly classified based on an investment "life cycle", since the need and access to capital varies based on a company's stage of development. The very earliest investments in startup companies are called "seed" investments, while investments in the early stages of a company's development are called "early stage" investments. In the analysis conducted for this report, early stage funding was typically understood to encompass the seed round, first round and second round of financing for a company. Companies typically need smaller amounts of capital at this stage of their development. Generally, the proceeds from these financings are used to fund research and development activities. Financings that are provided after the early stage are referred to as "later stage" or "expansion" financings. Generally, the proceeds from these financings are used to fund clinical trials, manufacturing, and sales and marketing activities.

Companies see funding from a variety of sources including:

*Government Funding Programs*: There are a number of federal and state government programs available to provide funding to biotechnology companies. The State Profiles section of this report describes a number of state government programs. These programs often have economic development objectives and are not driven solely by considerations of return on investment. Government funding programs often take the form of grants, loans and loan facilitation programs, and are typically aimed at smaller companies or funding amounts. Recently, an increasing number of state governments have also created programs to directly support venture capital investment in biotechnology companies. These may take the form of a stand-alone venture capital fund that targets investments in biotechnology companies, or a "fund of funds", in

which the state invests in a number of professionally-managed venture capital funds. The state profiles in this report focus on programs that directly impact the funding of for-profit biotechnology companies. Less attention is paid to the funding of other entities such as universities and foundations. Policies such as tax incentives, which may have an indirect impact on encouraging funding, are not considered.

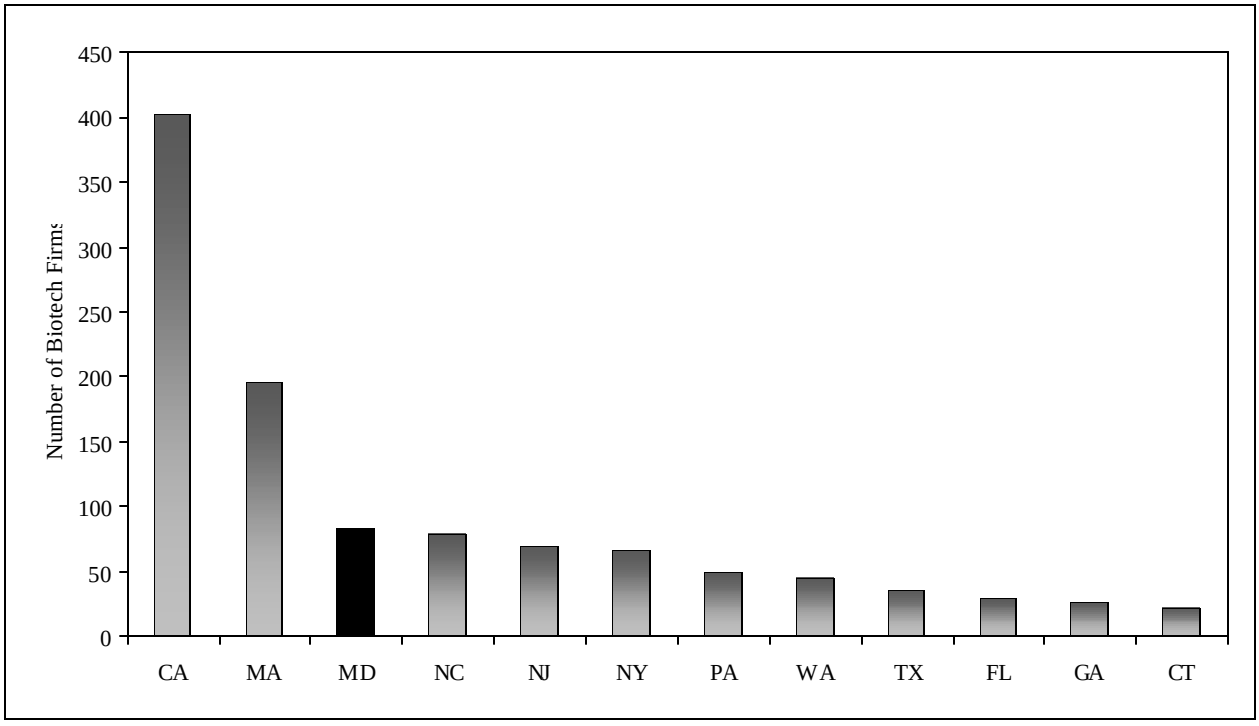
*Private Venture Capital*: Privately-held biotechnology firms can also raise capital through a number of non-government sources, which are collectively referred to as "private venture capital" in this report. Professionally-managed venture capital funds are typically private partnerships or closely-held corporations. The managers of these funds carefully screen the technical and business merits of their funds' investments and only invest in a small percentage of the businesses they review. While investors in these funds have a long-term investment perspective, they are driven by the expected rate of return on an investment. In recent years, investments by venture capital arms of large corporations have become increasingly common. This corporate venture capital typically occurs in later stages and for larger amounts. Seed rounds or early state investments are often raised from individual, "angel" investors. Private venture capital does not include capital raised from public markets (e.g., through public or follow-on offerings), or from government funding programs.

## II. MARYLAND: BIOTECHNOLOGY AND VENTURE CAPITAL NEEDS

### Private Venture Capital Environment: Benchmarking Maryland against Other States

Maryland is one of the leading states for biotechnology firms. As shown in Exhibit 1 below, Maryland's biotechnology industry is the third largest in the country, ranked by number of companies (behind California and Massachusetts).[1]

**Exhibit 1. Leading Biotechnology States: Number of Biotechnology Firms by State, 2000**

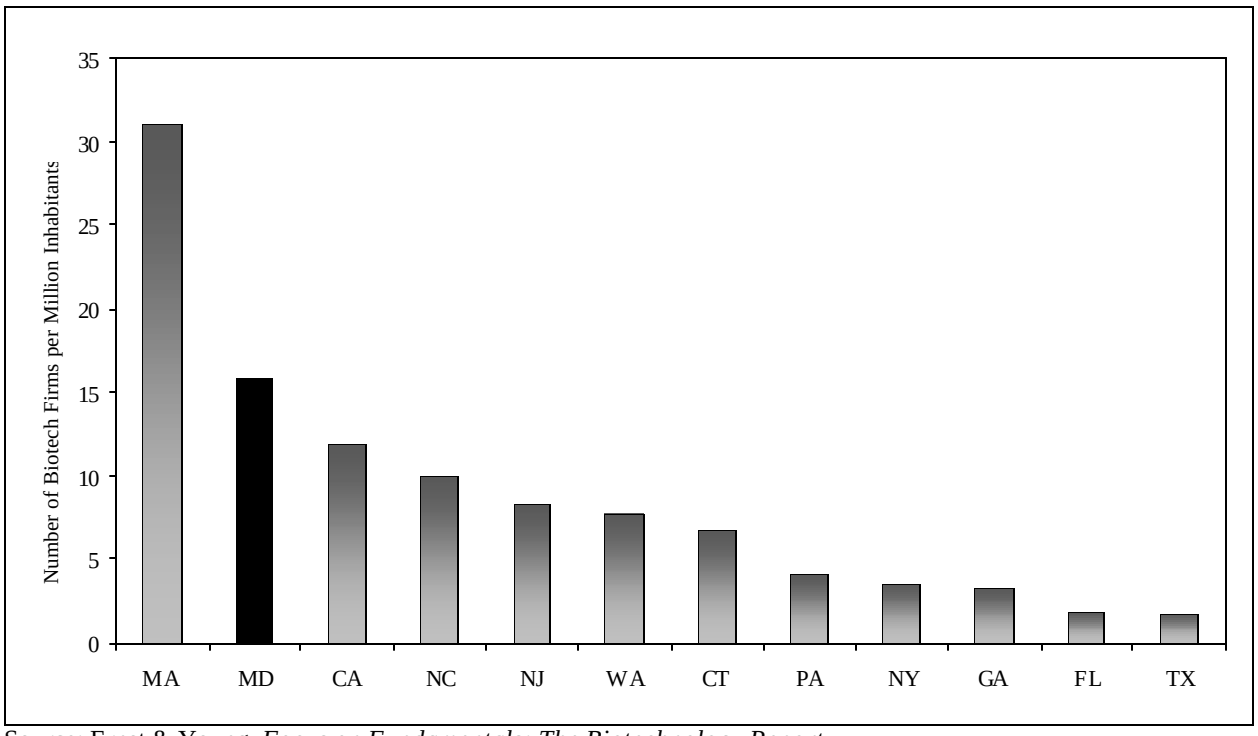



Source: Ernst & Young, *Focus on Fundamentals: The Biotechnology Report*

[1] The number of companies in each state is from Ernst & Young's 2001 Biotechnology Report. While the number of biotechnology companies in Maryland is less than the number shown on MdBio's list of biotechnology companies, the E&Y Report uses a similar methodology for counting companies in all states, and was therefore used for purposes of inter-state comparison throughout this report.

Comparing the number of companies per state does not account for the fact that some states have considerably larger populations than others. A "normalized" measure, which adjusts for different state sizes by dividing the number of biotechnology firms by the state population, shows Maryland's biotechnology industry ranking second, behind only Massachusetts. (Exhibit 2)

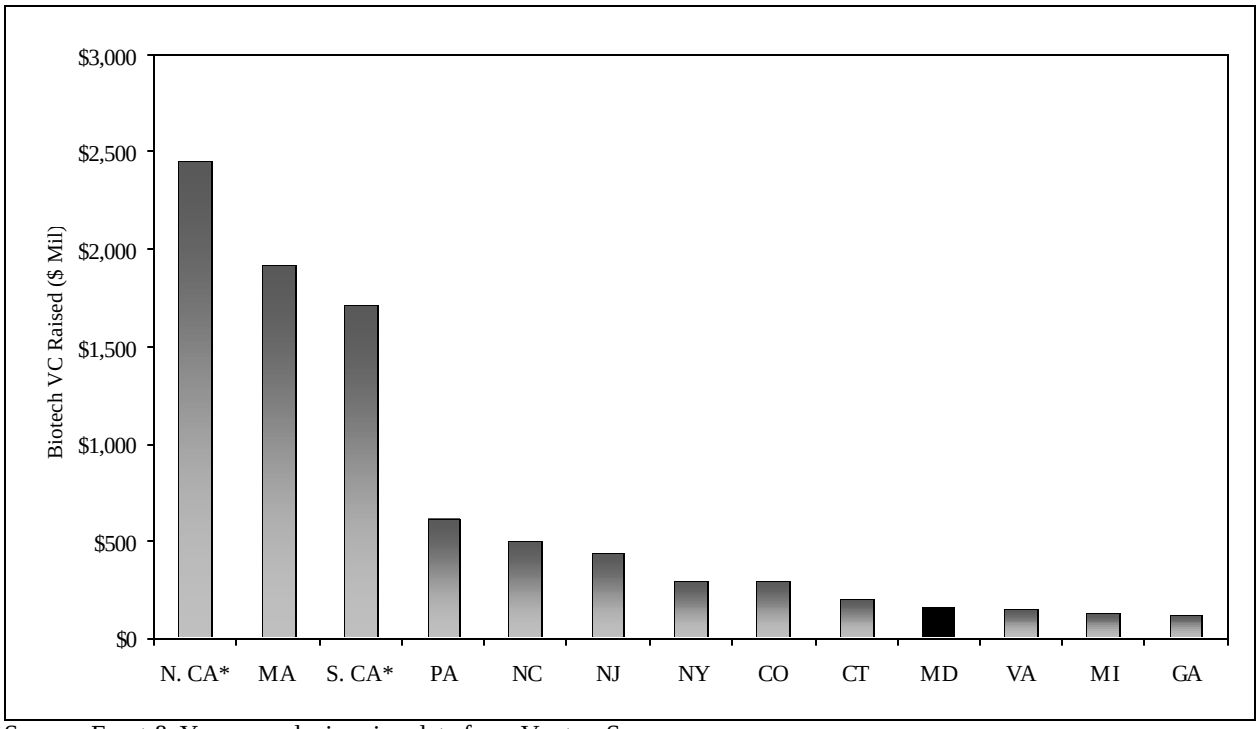
**Exhibit 2. Number of Biotechnology Firms by State Relative to State Population, 2000**




Source: Ernst & Young, *Focus on Fundamentals: The Biotechnology Report*

Maryland's biotechnology industry is attracting much less venture capital than might be expected based on the number of firms. This study collects and analyzes data from Maryland and eleven selected states considered to have thriving biotechnology industries. Of these 12 states, Maryland ranks ninth in private venture capital raised since 1995 (Exhibit 3).

**Exhibit 3. Biotechnology Private Venture Capital Raised by State, 1995-2001**




Source: Ernst & Young analysis using data from VentureSource

* California data shown separately for Northern California (primarily the San Francisco Bay Area) and Southern California (primarily the San Diego area)

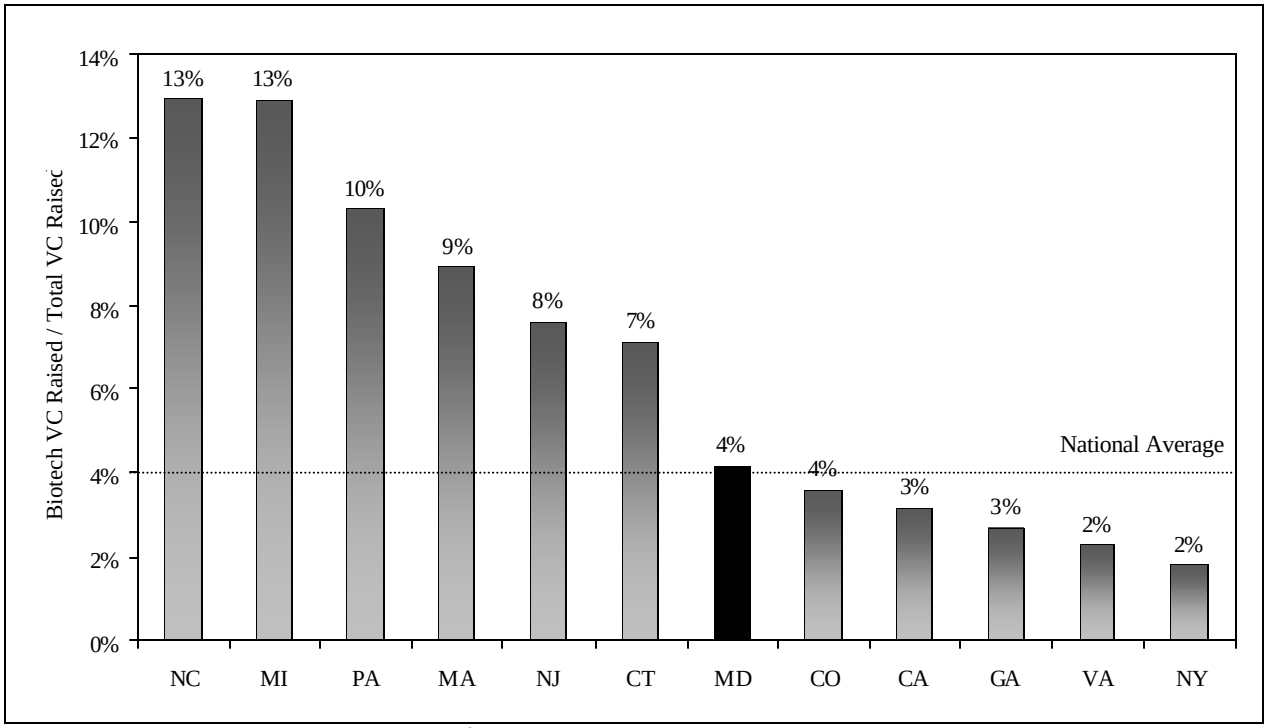
Maryland as a state ranks relatively low in the amount of private venture capital raised by its biotechnology companies, and Maryland ranks last in venture capital based on the number of biotechnology companies in each state (Exhibit 4).

**Exhibit 4. Biotechnology Private Venture Capital Raised 1995-2001 Relative to Number of Biotechnology Companies**


Source: Ernst & Young analysis using data from VentureSource

Exhibit 5 measures the percentage of the overall venture capital raised by companies in each state that is actually received by biotechnology companies. Maryland is in the middle of the group and at the national average, with 4 percent of the state's venture capital raised being received by biotech firms. North Carolina heads the list (13 percent), reflecting the importance of the industry in the state's venture capital environment, while in California, relatively more venture capital flows to high technology industries than to biotechnology.

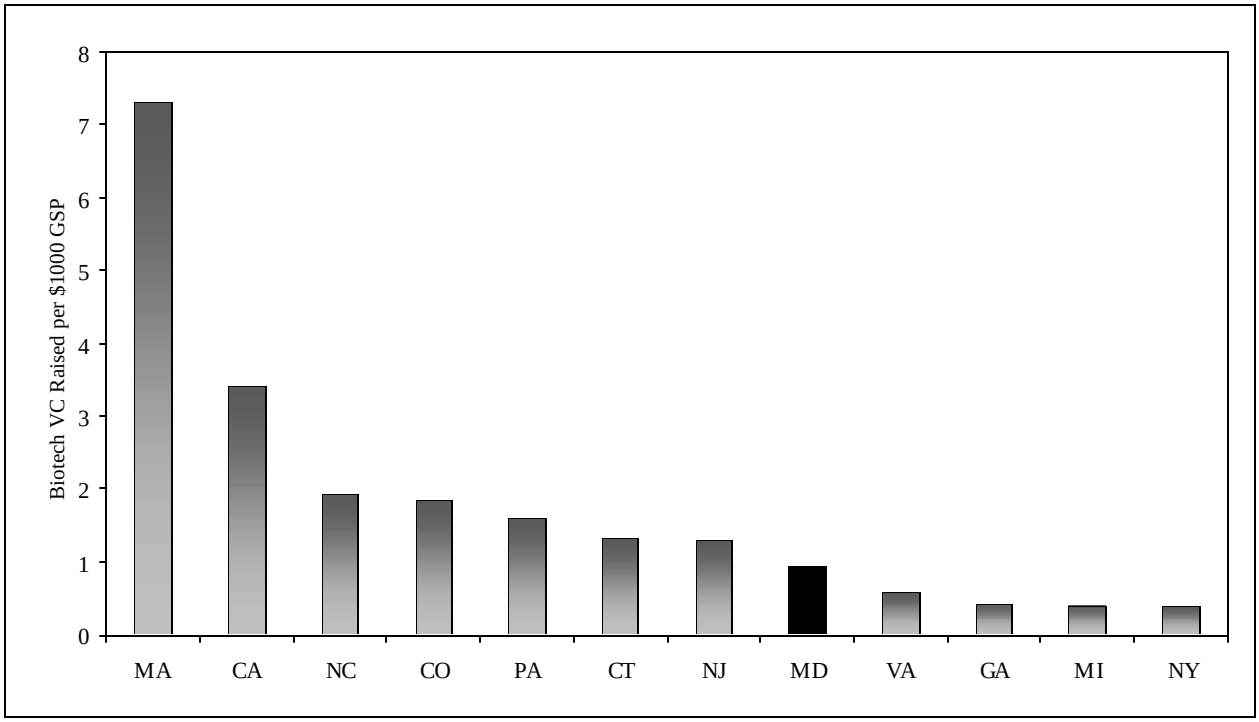
**Exhibit 5. Biotechnology Private Venture Capital as a Share of Total Venture Capital Raised by State, 1995-2001**




Source: Ernst & Young analysis using data from VentureSource

Exhibit 6 measures the private venture capital raised by biotechnology companies relative to gross state product. This graph compares the amount of venture capital raised by the states to the size of the state's economy. Companies in other states raised significantly more venture capital than those in Maryland, relative to the size of the state's economy.

**Exhibit 6. Biotechnology Private Venture Capital, 1995-2001, Relative to Gross State Product**




Source: Ernst & Young analysis using data from VentureSource

**Need/Demand for Capital and Maryland's Venture Capital Gap**

As the benchmarking exhibits in the previous section demonstrate, Maryland's biotechnology industry faces a shortfall in private venture capital financing. Exhibit 4, in particular, shows that Maryland attracts very little private venture capital relative to the size of its biotechnology industry.

How large is Maryland's venture capital gap? One could estimate the difference between the capital obtained and the capital sought by all privately-held biotechnology companies in the state. However, this measure would be misleading. Not every company that seeks funding would – or should – get funding. Venture capitalists usually require a compelling business plan and evidence of the ability to generate returns before agreeing to fund a company. Many state-sponsored funding initiatives have similar requirements. While state programs may be motivated by business development concerns rather than exclusively by maximizing financial returns, and may sometimes have more liberal eligibility requirements, they are hardly likely to fund all companies seeking aid. State programs are generally accountable to legislatures for their budgets, and some measure of financial return may be required. Successfully achieving economic development goals requires that companies that are funded survive, raise more capital through subsequent rounds, and help grow the economy. The total demand for capital is unlikely to be met, regardless of the source. A better question is the *whether there is a gap in funding that may realistically be closed*.

Exhibit 4 suggests that Maryland has a funding gap. While one may assume that Maryland biotechnology companies have similar funding needs as companies in other parts of the country, since 1995, they have attracted about one-fourth to one-fifth of the average private venture capital raised by companies in the other 11 states. This suggests that Maryland companies should be attracting approximately $100 to $125 million in venture capital financing per year, as compared to the $25 million annual average they have attracted since 1995. If the supply of venture funding averages $25 to 50 million per year over the next 3 to 5 years, the funding that needed to close the gap would be approximately $50 to 100 million per year.

This funding gap could have implications for the state of Maryland. The atmosphere in Maryland has generated a large number of biotechnology companies that could attract venture capital. However, if the current gap persists, it could hold back Maryland companies from successfully achieving their full potential. Providing companies with adequate capital would increase the odds that they will survive, raise more capital through subsequent rounds, and help grow the economy.

**Maryland's Private Venture Capital Gap in Context**

Maryland's estimated private venture capital funding gap raises several questions that need to be addressed to fully understand the issue.

*Does the private venture capital gap disappear when government funding is included?*

One possible explanation for Maryland's private venture capital gap is that the state may have more public funding of biotechnology companies. Is it possible that there is no gap in total funding for Maryland biotechnology companies when both private and government funding are considered? While the State Profiles section details the state-supported funding initiatives available to companies in each state, direct comparisons of the total public funding are not readily available across states because of incomplete or unavailable data. For instance, many state programs which are available to biotechnology companies are not restricted to the biotechnology industry.

Data is available, however, on the financing of Maryland biotechnology companies through DBED programs. Total DBED programs provided Maryland biotechnology companies with a total of $24.6 million since 1995[2]. These government fundings were added to the private venture capital raised by Maryland biotechnology companies, to evaluate their impact on Maryland's venture capital gap. This total, plus the $10 million being invested through the Enterprise Venture Capital Limited Partnership, would still leave Maryland last among the states surveyed based on capital raised relative to the number of companies. In other words, Maryland's government funding *and* private venture capital for biotechnology companies is proportionally less than any other state's private venture capital funding *alone*. Even under the most conservative assumptions about including government funding, Maryland has a significant funding gap.

*Is the private venture capital gap a result of fewer "fundable" companies in Maryland?*

Another possible explanation for Maryland's private venture capital gap is that fewer Maryland companies need venture capital because Maryland companies are smaller or are service companies, which traditionally do not attract as much venture capital.

The cross-state comparisons included in this report and the implied venture funding gap are based on a conservative definition of biotechnology companies[3], focused on medical

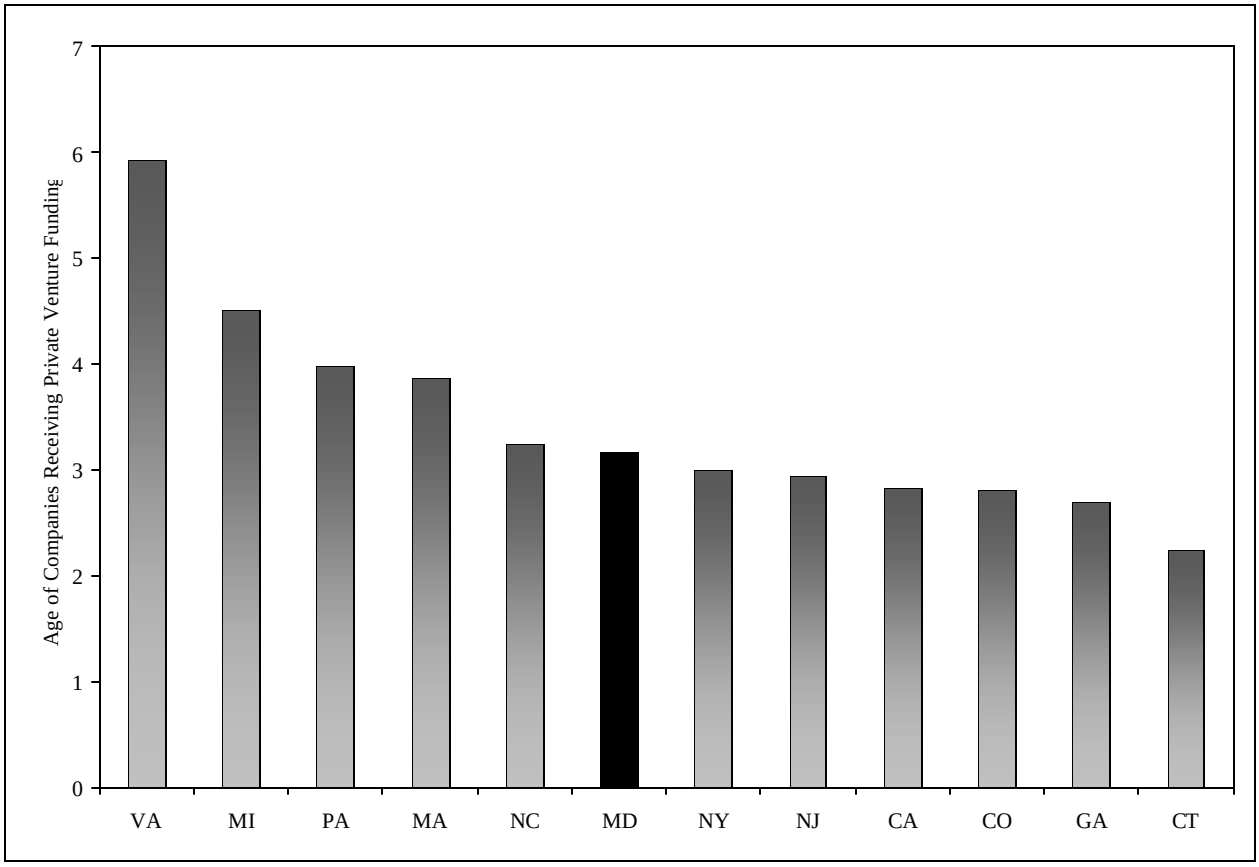
[2] This amount excludes MIDFA, which provides loan guarantees to help companies obtain loans, rather than making direct grants or loans to companies.

[3] The estimates are based on E&Y's list of biotechnology companies. This list is comprised primarily of medical biotechnology companies that are engaged in research based drug discovery. Service providers such as contract research organizations are largely excluded. E&Y has been compiling this list of US biotechnology companies for fifteen years, and the list is updated every year based on information about bankruptcies, mergers and acquisitions, new companies, and a survey of E&Y biotechnology professionals. The E&Y list is considerably more conservative

biotechnology companies that are engaged in research-based drug discovery. Companies that are not appropriate candidates for venture capital, such as service providers and companies in their earliest stages, are largely excluded from this list. In addition, a consistent methodology is used across states, so that companies less deserving of funding should be as likely to be included in the other states as there are in Maryland.

In addition, Maryland companies that have obtained private venture capital since 1995 were compared to biotechnology companies that obtained private venture capital in other states. Comparing the age of these companies at the time they obtained funding shows that Maryland companies were of average age (see Exhibit 7). This would suggest that the Maryland companies being compared in this analysis are of similar age to companies in other states, and therefore, are likely to be at similar stages in the funding lifecycle and have similar funding needs.

**Exhibit 7. Median Age of Companies Receiving Private Venture Capital, 1995-2001**




Source: Ernst & Young analysis using data from VentureSource

in its definition of biotechnology companies and has a smaller number of companies as compared to the list provided by MdBio, for example.

*Does Maryland's venture capital gap occur primarily in certain funding amounts?*

Given Maryland's private venture capital gap, a natural question is whether this gap applies to all funding amounts or whether it applies most to certain funding amounts. Conversations with venture capitalists and industry insiders suggest that the gap in funding is most likely to occur for companies seeking $3 to 10 million. Amounts below $3 million are often obtainable through government programs and angel investors, and amounts over $10 million may be obtained from larger, institutional venture capital funds focused on later stage financing, but amounts in the middle are not as easily obtained.

This anecdotal evidence was tested against the data on private venture financings. The data suggest that the gap is most pronounced for amounts above $3 million, where Maryland companies closed relatively fewer rounds of financing than those in any other state. The gap appears least significant for amounts below $3 million. Close to half the financing rounds completed since 1995 were for amounts below $3 million – higher than for any other state. However, the overall size of Maryland's gap is so large that there appears to be some shortfall in funding across all funding amounts.

## III. RECOMMENDATIONS

If there is a gap in venture funding for Maryland bioscience companies, what actions should the state government consider undertaking to close the gap? The next section details the state-supported biotechnology programs in Maryland and the 11 other selected states. These programs take a number of different forms, and information about the success of different approaches is not always available, either because the programs are new and do not have a sufficiently long track record, or because the information is not publicly available.

As Maryland considers finding creative ways to support the financial needs of biotechnology companies, it may wish to evaluate new programs or changes to existing programs, and additional sources of funds:

- Biotech-Focused Venture Capital Program: Much of Maryland's government-supported venture capital investment has not focused exclusively on Maryland companies or on its biotechnology industry. The Maryland Venture Capital Trust (MVCT) has invested all of its $19.1 million in eight, competitively chosen venture funds with no fund being focused on Maryland's biotechnology industry or even companies in the state. More recently, Maryland Enterprise Venture Capital Limited Partnership has invested $10 million in six funds, none of which focus exclusively on Maryland biotechnology companies. The Enterprise Investment Fund does invest directly in Maryland companies, and has invested $3.3 million in Maryland biotechnology companies since 1995. For purposes of comparison, North Carolina's Bioscience Investment Fund has raised about $30 million. However, North Carolina's investment has gone entirely to fund biotechnology companies in the state. A greater focus on state-specific biotechnology investments, either through changes to existing programs or through the creation of a new state-supported biotechnology venture capital fund, could help raise the industry's share of venture capital raised and close the existing funding gap.

- Greater Private Sector Involvement in Venture Capital Funding: One common practice in many state programs is to leverage public sector funds with other private sector investments. Many loan and investment programs, including Maryland's, have co-investor matching requirements. State-supported venture capital programs are often started with a state appropriation, which is successfully leveraged into funding from private sources. Private sector involvement increases the accountability of the recipient and increases the benefit obtained from each invested taxpayer dollar. North Carolina's Bioscience Investment Fund, for example, was created by the legislature with an initial $10 million investment and was successfully leveraged with an additional $20 million from private companies. Maryland' state-supported venture capital funding programs, on the other hand, do not appear to have leveraged state money to private sector investments to the same extent. The Maryland Venture Capital Trust and Enterprise Venture Capital Limited Partnership Fund were funded entirely from public money and have invested in venture capital funds with the understanding that the funds will do their best to invest equivalent amounts or more in Maryland companies. Only the Enterprise Investment Fund has a hard requirement, requiring companies funded through the program to raise at least three times as much capital from private sector investors. To increase private sector involvement in venture funding of biotechnology

companies, Maryland could consider establishing a biotechnology-specific venture capital fund in which the state and private sector participants are investors, with an established ratio of state to private money.

- Tobacco Settlement Money: A few states have allocated a portion of the funds received from the settlement of litigation against the tobacco companies to biotechnology-related activities. Michigan has allocated about 12 percent of its settlement to its Life Sciences Corridor. Pennsylvania has allocated 1.4 percent of its tobacco money to biotech-related activities. (Table 1) Although tobacco settlement money will be paid out over 25 years, these states have allocated their money up front. For example, Michigan will allocate at least $50 million per year from its settlement money for the next 10 years. (These programs are further described in the State Profiles section).

  Maryland expects to receive $4.4 billion in tobacco settlement money.[4] Maryland has not allocated any money from its settlement specifically to biotech-related activities, though, like some other states, it has allocated funds to cancer prevention and research, some of which could go to biotech activities. If 5 percent of Maryland's settlement were allocated to funding biotechnology companies, more than $200 million in additional funding would become available to Maryland biotech companies. As outlined above, this amount could be further leveraged to attract private sector funding. A program along these lines could be enough to close Maryland's funding gap for several years.

**Table I Tobacco Settlement Investments in Biotechnology-Related Funding**

| State | Tobacco Settlement Money | Monies Allocated for biotech or biotech-related VC | Type of Allocation | Percent of total for biotech |
|---|---|---|---|---|
| MD | $4,429 M | None | None | 0.0% |
| MI | $8,526 M | $1,000 M | Life Sciences Corridor: Completely biotech, with some venture capital investments | 11.7% |
| PA | $11,259 M | $160 M | Greenhouse program with biotech aspect ($100m) and a biotech specific VC fund ($60m) | 1.4% |

- Public Pension Money: As of 1999, the State Retirement and Pension System of Maryland had $5.8 million invested in venture capital through the Maryland Venture Capital Trust, out of $29.7 billion of total assets under management. . This represents 0.02 percent of total assets under management. The California Public Employees' Retirement System (CalPERS), by comparison, has invested about $2 billion, or approximately 1.2 percent of its assets under management in venture capital funds. If Maryland's pension were to invest approximately one percent of its assets under management in venture capital and allocated half that amount

[4] Maryland tobacco settlement funds will pass through the Maryland Cigarette Restitution Fund Program (CFRP) and will go to the following three areas: (1) Cancer prevention, education, screening & treatment, (2) tobacco use prevention and cessation, and (3) crosscutting projects. Some funding for biotechnology could already flow through (1).

to biotechnology, the state's biotech companies would have available $150 million in potential funding, which would help close the venture funding gap.

Maryland may seek to increase its funding of biotechnology venture capital through state action by creating a new venture capital fund targeted specifically at the biotechnology industry. The fund could be funded from the state's tobacco settlement or public pension money. Consideration should also be given to seeking funds from private investors in order to leverage the state’s investments.

## IV. STATE PROFILES: EXISTING VENTURE CAPITAL CLIMATE IN MARYLAND & SELECTED STATES

### Maryland

#### *1. Private Venture Capital*

**Maryland Biotechnology Industry Private Venture Capital Funding**
**Dollars in Millions**
***(Number of Financings in Italics)***

| | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | Total |
|---|---|---|---|---|---|---|---|---|
| Biotech Venture Capital Raised | $14.2 M | $20.1 M | $13.0 M | $9.0 M | $10.0 M | $69.6 M | $28.4 M | $164.3 M |
| *Biotech Number of Financings* | *3* | *4* | *3* | *3* | *2* | *13* | *5* | *33* |
| All Industries VC Raised | $74.8 M | $79.8 M | $264.6 M | $312.0 M | $880.1 M | $1,853.4 M | $448.3 M | $3,913.0 M |
| Biotech VC / Total VC | | | | | | | | 4% |

Source: Venture Capital and Number of Financings data from VentureSource's VentureOne database. Compilation by Ernst & Young LLP. Estimates are for calendar years shown, except 2001 through Fall 2001. Biotech Venture Capital Raised shows private sector financings of Biopharmaceutical companies headquartered in Maryland. Financings include those from professional venture capital firms, corporate investors and other private sources, but exclude funds from government sources. Financings also exclude public offerings, acquisitions and buyouts. All Industries VC Raised data is from National Venture Capital Association / VentureExpert, with adjustments by Ernst & Young to adjust for differentials between the VentureSource and VentureExpert databases.

#### *2. Government Funding Programs*

**Summary of Maryland State Biotech Funding Initiatives**

| Name | Type | Size of Invest-ments | Total Disburse-ments | Co-investor match | Biotech Specific | State Specific | Other | Source of Funding | Manage-ment |
|---|---|---|---|---|---|---|---|---|---|
| Maryland Venture Capital Trust | VC: Fund of Funds | $1-3 Mil | $19.1 Mil | None | No | No | | State Pensions; One time | Public |
| Enterprise Venture Capital Limited Partnership Fund | VC: Fund of Funds | $1.5 - 4 Mil | $10 Mil | None | No - all tech | No | | | Public |
| Enterprise Investment Fund | VC Equity | $150K - $500K | $3.3 Mil | 3:1 | No - all tech | Yes | | State budget; Annual | Public |
| Economic Development Opportunities Fund (Sunny Day) | Loans / Grants | $300K-$4m; avg since '95 = $1.1m | $13.1 Mil | 5:1 | No | Yes | | State budget; Annual | Public |
| Maryland Industrial Development Financing Authority | Loan guar | N/A | $127.8 Mil | N/A | N/A | Yes | | State budget; Annual | Public |

| Name | Type | Size of Invest-ments | Total Disburse-ments | Co-investor match | Biotech Specific | State Specific | Other | Source of Funding | Manage-ment |
|---|---|---|---|---|---|---|---|---|---|
| Maryland Small Business Development Financing Authority | Loans, loan guar., equity | Loans up to $500K; equity up to $250K | $370K | N/A | N/A | Yes | Disadv. Business | State budget; Annual | Public |
| Challenge Investment Program | Loan / revenue sharing | $50K - $150K | $1.4 Mil | 1:1 | No - all tech | Yes | | State budget; Annual | Public |

a. Government Supported Venture Capital

The *Maryland Venture Capital Trust* was created through state legislation to provide an opportunity for state and local pension funds to undertake venture capital investments. The Trust functioned as a "fund of funds" investing in other venture capital funds. The Trust has a seven-member Board of Trustees appointed by the Governor with Senate advice and consent. To date, the Trust has invested $19.1 million in eight venture capital partnerships – all prior to 1995. The Trust invested this amount in a diverse group of funds, and does not plan further investments. The funds selected do not appear to focus exclusively on Maryland companies (see Table below).

**Investments by Maryland Venture Capital Trust**

| Fund | Investment | Industry Focus | Geographic Focus |
|---|---|---|---|
| Catalyst Ventures | $3.0 million | Information Technology | South central and Southwest US |
| Oxford Bioscience Partners | $3.0 million | Life Sciences | None, but several in MD companies |
| Edison Venture Fund III | $3.0 million | Information Technology | Mid-Atlantic |
| GroTech Partners IV | $3.0 million | | Mid-Atlantic |
| Calvert Social Venture Partners | $2.0 million | Companies with positive social impact | None, but significant investments in Mid-Atlantic |
| TDH III | $2.0 million | Several | |
| Kitty Hawk Capital LP, III | $1.6 million | Primarily IT and Healthcare | Southeast |
| Tri-Tech Partners | $1.5 million | -- | -- |

Like the MVCT, the *Maryland Enterprise Venture Capital Limited Partnership* (EVCL) is a fund of funds that makes investments in private venture capital partnerships to increase the growth of start-ups within the state. The state does not oversee the use of the funds, but makes investments with the understanding that each partnership will make best efforts to invest in firms based in Maryland. As shown in the accompanying table, EVCL has committed $10 million to five venture capital funds. Most of the commitments were made in late 1999, with the most recent, to Toucan Capital, made in 2001.

**Investments by Maryland Enterprise Venture Capital Limited Partnership**

| Fund | Investment | Industry Focus | Geographic Focus |
|---|---|---|---|
| Inflexion Point Ventures LP | $1.5 million | Information Technology | Mid-Atlantic |
| Boulder Venture III LP | $1.5 million | Information Technology | Mid-Atlantic |
| GroTech CAPITOL Group LP | $1.5 million | Information Technology | Mid-Atlantic |
| Walker Investment Fund III LP | $1.5 million | Information Technology | Mid-Atlantic |
| Toucan Capital | $4.0 million | Biotech & Information Technology | Mid-Atlantic |

Maryland's third state-supported venture capital initiative, the *Enterprise Investment Fund*, invests directly in companies rather than using a fund of funds structure. However, public investments made under EIF are leveraged with matching investments by venture funds – the program has a 3:1 matching funds requirement. EIF makes direct equity investments in early stage technology companies that have proprietary technologies. EIF often makes investments in companies that have "graduated" from investments made under the Challenge Investment Program (described below). Companies funded by the fund often develop their proprietary technologies working with universities and research labs such as Johns Hopkins and the National Institutes of Health. Companies funded must agree to maintain its principal operations in Maryland for at least 5 years.

b. Government Grants and Loans

A number of programs are run by the Maryland Department of Business and Economic Development (DBED). These include the following:

The *Sunny Day Fund* (also known as the Economic Development Opportunities Fund) was started in 1988 with an initial appropriation of $5 million. The taxpayer funded program is administered by DBED, though disbursements require legislative approval. The fund provides financial assistance to companies that have the potential to create extraordinary economic development opportunities, including:

- Being in a targeted growth sector (including telecommunications, financial services, distribution, biotechnology and manufacturing)
- Planning substantial job creation/retention
- Making a minimum investment five times the amount of the Sunny Day Fund appropriation; and
- Obtaining local government participation.

Fund money is initially given in the form of a loan that becomes an outright grant if the company meets employment levels called for in the loan agreement. In 2000, the fund played a role in attracting Netherlands-based Qiagen to establish its North American headquarters in Montgomery County.

The *Maryland Economic Development Assistance Authority and Fund (MEDAAF)* provides funding to Maryland companies in priority funding areas and eligible industry sectors. The Fund provides loans to companies for projects with a strong potential for job creation or retention in Maryland.

The *Maryland Industrial Development Financing Authority (MIDFA)* is designed to spur private sector investment in economic development programs through loan insurance programs (which insure loans by private lenders up to 80% or $2.5 million), bond issuances (insuring bonds up to 100% or $7.5 million), and linked deposits (providing CDs to lenders who provide loans at below market rates to eligible businesses).

The *Maryland Small Business Development Financing Authority (MSBDFA)* provides financing options for small businesses and those owned by "socially or economically disadvantaged persons." Offers a Contract Financing program that offers loan guarantees and working capital to businesses that are under contract by the state or public utility. The Equity Participation program offers loans, equity investments, and loan guarantees to disadvantaged businesses in the field of franchising or technology.

The *Maryland Economic Development Fund (MEAF)* aides businesses in the state in the modernization of their manufacturing operations, the exploration of new markets, and the development of new applications for technology. In order to be eligible, applicants must show ability to repay the loan, as well as the inability to acquire funding through traditional lending institutions. The maximum loan size is $500,000.

The *Challenge Investment Program* provides financing to start up stage companies in order to allow them to bring their product to market. In order to be eligible companies must have annual sales of less than $1 Million and fewer than 25 employees. The program has a 1:1 matching funds requirement, and is limited to technology companies that are located within the state. Investments may reach $150,000, but additional financing is available based on the performance and achievements of the firms. The return on the investments made by the Challenge Investment Program is 1 percent of company revenues in excess of $500,000. If the companies funded do not earn revenues in excess of $500,000, they repay the principal instead.

Maryland *Technology Development Corporation* (TEDCO) was created by the Maryland State legislature in 1998 as a “public instrumentality of the State." Governed by a 15-member Board, appointed by the Governor with advice and consent of the Senate, the Board is composed of leaders in the State's technology community and contains representatives from these sectors: private, university, non-profit, and public. TEDCO’s mission is to foster the development of a technology economy that will create and sustain businesses throughout all regions in the State of Maryland. This mission is accomplished through the enhanced transfer of technology from universities and federal laboratories to the private sector and through the facilitation of the growth of innovative companies in critical, emergent technology or high growth sectors. Although not biotechnology specific, a number of biotechnology companies are served by this state-sponsored organization.

In FY 2002, Maryland initiated the Maryland Incubator Development Fund. The $5 million fund is designed to develop technology-oriented business incubators throughout the State. TEDCO, in coordination with the Maryland Department of Business and Economic Development (DBED) is providing matching awards to qualified groups interested in developing incubator programs. The funds are restricted to capital development and can be carried over year to year but no jurisdiction can receive more than $1 million in assistance in any one year. Additionally,

TEDCO has a pilot program that received a FY2002 funding of $460,000 to provide up to $50,000 seed-stage 'awards-for-royalty' support the development of technology companies working with federal laboratories. These funds are not restricted to biotechnology business startups.

## California

California dominates the U.S. biotechnology industry. The state has more biotechnology companies than any other and ranks third in the U.S. (behind Massachusetts and Maryland) when on a per capita basis (number of firms divided by state population). The two major hubs in the state -- San Francisco and San Diego areas – account for 22 and 9 percent, respectively, of U.S. public biotechnology companies.

### *1. Private Venture Capital*

The following tables show the growth of the venture capital environment in the San Francisco Bay Area and the San Diego Area. San Francisco biotechnology companies raised $2.4 billion in venture capital from 1995 to 2001, while San Diego biotechnology companies raised $1.7 billion during the same period.

**San Francisco Bay Area Biotechnology Industry Private Venture Capital Funding**

**Dollars in Millions**

***(Number of Financings in Italics)***

| | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | Total |
|---|---|---|---|---|---|---|---|---|
| Biotech Venture Capital Raised | $112 M | $190 M | $315 M | $249 M | $541 M | $756 M | $297 M | $2,460 M |
| *Biotech Number of Financings* | *20* | *22* | *35* | *37* | *41* | *44* | *31* | *230* |
| All Industries VC Raised | $1,921 M | $3,130 M | $4,380 M | $5,590 M | $18,807 M | $32,435 M | $6,066 M | $72,328 M |
| *All Industries No. of Financings* | *425* | *619* | *728* | *850* | *1547* | *1757* | *385* | *6311* |
| Biotech VC / Total VC | | | | | | | | 3% |

Source: Venture Capital and Number of Financings data from VentureSource's VentureOne database. Compilation by Ernst & Young LLP. Estimates are for calendar years shown, except 2001 through Fall 2001. Biotech Venture Capital Raised shows private sector financings of biopharmaceutical companies headquartered in SF Bay Area. Financings include those from professional venture capital firms, corporate investors and other private sources, but exclude funds from government sources. Financings also exclude public offerings, acquisitions and buyouts.

**San Diego Area Biotechnology Industry Private Venture Capital Funding**

**Dollars in Millions**

***(Number of Financings in Italics)***

| | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | Total |
|---|---|---|---|---|---|---|---|---|
| Biotech Venture Capital Raised | $62.0 M | $164.1 M | $166.4 M | $161.9 M | $266.5 M | $467.7 M | $426.8 M | $1,715.3 M |
| *Biotech Number of Financings* | *15* | *27* | *24* | *26* | *28* | *48* | *27* | *195* |
| Biotech VC / Total VC | | | | | | | | 3% |

Source: Venture Capital and Number of Financings data from VentureSource's VentureOne database. Compilation by Ernst & Young LLP. Estimates are for calendar years shown, except 2001 through Fall 2001. Biotech Venture Capital Raised shows private sector financings of biopharmaceutical companies headquartered in the San Diego Area. Financings include those from professional venture capital firms, corporate investors and other private sources, but exclude funds from government sources. Financings also exclude public offerings, acquisitions and buyouts.

## *2. Government Funding Programs*

**Summary of California State Biotech Funding Initiatives**

| Name | Type | Size of Investments | Total Disburse-ments | Co-investor match | Biotech Specific | State Specific | Other | Source of Funding | Manage-ment |
|---|---|---|---|---|---|---|---|---|---|
| California Emerging Ventures | VC: Fund of Funds | Variable; historically $350 - $500 mil | $2 Bil (including non-biotech) | N.A. | No | No | | State Budget; Pension funds | Private |
| California Biotechnology Program | VC: Fund of Funds | $10-100 mil | $285 Mil (out of $500 Mil raised) | N.A. | Yes | No | | State Budget; Annual | State |
| California Technology Investment Partnership (CalTIP) | Grants | Up to $250K | Approx. $7-8 Mil since 1995 to Biotech | Yes, 3:1 | No | Yes | | Combination of state, federal, and private; Annual | State |

a. Government Supported Venture Capital

The *California Public Employees' Retirement System (CalPERS)*, the nation's largest public pension fund, has recently begun investing in venture capital. It formed the *California Emerging Ventures (CEV)* program in 1998, a fund-of-funds managed by Massachusetts-based Grove Street Advisors. In March 2001, CalPERS invested an additional $500 million in CEV, on top of earlier investments of $730 million. The CEV fund has generated an internal rate of return of 78 percent for all its portfolio investments as of September 30, 2000. CalPERS investment in venture capital now totals more than $2 billion, though not all of this is allocated to biotechnology-specific investments.

In June 2000, CalPERS created the *California Biotechnology Program* to invest in funds which invest in early stage biotechnology companies both in and out of the state. The program has an initial allocation of $500 million. In December 2000, the program announced its first five investments totaling $285 million:[5]

- A $100 million investment in Palo Alto, California-based Prospect Venture Partners II, a venture capital firm that focuses exclusively on life science investments;
- A $100 million investment in South San Francisco, California-based, MPM Biotech Crossover Fund, L.P., a fund that makes both private and public investments in the biotechnology industry;
- A $25 million investment in Burrill Life Sciences Capital Partners, a fund sponsored by Burrill & Co., a San Francisco, California-based private merchant bank dedicated to life sciences through private equity investing, corporate partnering and commercial development;
- A $10 million investment in the University of California, San Francisco (UCSF) Seed Capital Fund that will create a biotechnology incubator at the UCSF Mission Bay campus; and

[5] http://www.calpers.ca.gov/whatsnew/press/2000/1214a.htm

- A $50 million investment with EuclidSR, a partnership between New York-based Euclid partners and S.R. One, Limited, the venture capital arm of Smith Kline Beecham. The investment is expected to help CalPERS build profitable investment relationships with large pharmaceutical companies.

b. Government Grants and Loans

The *California Technology Investment Partnership (CalTIP) Program* provides grants to California technology companies to accelerate the commercialization of emerging technologies. The grants require a minimum 3:1 match from federal, applicant and partner funding. CalTIP has disbursed annually approximately $5 million from 1994 through 2001, with the exception of 2000, when it disbursed approximately $7 million. In the 2001-2002 State Budget, $6 million was allocated to the CalTIP program by the state. This funding is expected to leverage about $15 million in federal funds and $15 million in private funds. Biotechnology companies have received approximately 20% of these grants on average per year, with the percentage increasing slightly to 25% in 2001. The grants require a 3:1 leverage ratio each for both federal and private follow-up funding, but historical results show that companies have been able to leverage at a ratio of approximately 6:1.

Three state-established *Regional Technology Alliances -- the Bay Area RTA (BARTA), the San Diego RTA (SDRTA, and the Los Angeles RTA (LARTA)* -- assist the state in evaluating and monitoring CalTIP grant recipients. The RTAs are public-private partnerships that receive a portion of their funding from the state government. RTAs assist companies locating sources of public and private funding, identify business development and management support resources, and provide contacts for access to relevant markets.

c. Other Government Funding

California also has biotechnology university focused funding programs. The *Institute for Bioengineering, Biotechnology, and Quantitative Biomedical Research (QB3)* is a cooperative effort among three campuses of the University of California (Berkeley, San Francisco and Santa Cruz) and private industry. Governor Gray Davis established the Institute in December 2000 to facilitate the discovery and creation of new techniques for attacking biological problems of enormous complexity. The Institute will receive state funds totaling $100 million across the three campuses. For every dollar from the state, the Institute will provide $2 of external funding. The *Biotechnology Strategic Targets for Alliances in Research (BioStar) Program* is a UC-wide biotechnology matching grants program that provides matching funds for biotechnology research and forges partnerships between businesses, UC scientists, engineers, and students. Priority is given to requests for seed funding for new, innovative research projects that will enhance California firms' competitiveness, creating new jobs, developing new knowledge, and attracting greater investments for California. Private investors match BioSTAR funding at a ratio of at least 1:1.

## Colorado

### *1. Private Venture Capital*

Colorado does not have a significant biotechnology industry, and the state was not in the top 12 biotechnology states in the latest Ernst & Young report. Relatively small amounts of private venture capital have flowed to the state's biotechnology industry. Since 1995, biotechnology companies in the state raised $287 million in private venture funding, accounting for four percent of the total venture financing raised by Colorado companies.

**Colorado Biotechnology Industry Private Venture Capital Funding**
**Dollars in Millions**
***(Number of Financings in Italics)***

| | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | Total |
|---|---|---|---|---|---|---|---|---|
| Biotech Venture Capital Raised | $62.6 M | $12.0 M | $10.5 M | $51.4 M | $41.1 M | $57.0 M | $52.4 M | $287.0 M |
| *Biotech Number of Financings* | *4* | *2* | *5* | *7* | *7* | *7* | *1* | *33* |
| All Industries VC Raised | $278.0 M | $287.2 M | $370.1 M | $626.3 M | $1,523.8 M | $4,250.9 M | $657.7 M | $7,993.9 M |
| *All Industries No. of Financings* | *37* | *54* | *66* | *84* | *124* | *156* | *39* | *560* |
| Biotech VC / Total VC | | | | | | | | 4% |

Source: Venture Capital and Number of Financings data from VentureSource's VentureOne database. Compilation by Ernst & Young LLP. Estimates are for calendar years shown, except 2001 through Fall 2001. Biotech Venture Capital Raised shows private sector financings of biopharmaceutical companies headquartered in Colorado. Financings include those from professional venture capital firms, corporate investors and other private sources, but exclude funds from government sources. Financings also exclude public offerings, acquisitions and buyouts.

### *2. Government Funding Programs*

While research by Ernst & Young has not identified any state-sponsored biotechnology funding programs, the state appears to be aware of this shortcoming. The industry has established plans for a new *Colorado Biotechnology Association* with the intent of beginning operation in late 2001. The Association will be privately funded, and its main goal will be to promote the industry within the state, which includes among other things, making recommendations on state funded programs. The Association is considered a spinoff of the Governor-appointed Biotechnology Council, which was formed on a volunteer basis in 2000, with representatives from Colorado bioscience firms, institutions of higher education, public officials and trade organizations. The purpose of the Council was to recommend goals, policies and actions for developing the industry within the state.

In a March 2001 Report to the Governor, the Colorado Biotechnology Council recognizes that biotech development has not been a priority for the state and that there is limited seed and venture capital in the state due to a lack of venture capital firms in the state, resulting in much investment funding to come from the west- and east-coast. The report suggests several initiatives to promote biotechnology in the state, including:

- Centralizing the activities and initiatives for growth of the biotechnology industry. This includes establishing a permanent biotech council as well as setting up an office within the state government to focus solely on biotechnology.
- Offering additional tax incentives to increase the availability of seed and venture capital for start-up and early stage biotechnology companies.
- Incorporating into the state's economic development budget adequate funds for marketing and promoting the state as a location for biotechnology companies. The report suggests that the Governor's Office should work closely with the private sector to develop and implement an aggressive public relations and marketing program focusing on the biotechnology industry.

## Connecticut

### *1. Private Venture Capital*

Connecticut is the seventh largest biotechnology state (as measured by the number of companies located in the state) according to the latest Ernst & Young biotechnology report. Since 1995, biotechnology companies headquartered in the state raised over $200 million in venture capital from private sources. This accounted for about 7 percent of the total venture capital raised by Connecticut companies during that period.

**Connecticut Biotechnology Industry Private Venture Capital Funding**
**Dollars in Millions**
***(Number of Financings in Italics)***

| | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | Total |
|---|---|---|---|---|---|---|---|---|
| Biotech Venture Capital Raised | $4.0 M | $0.0 M | $0.8 M | $27.8 M | $0.8 M | $126.6 M | $43.0 M | $202.9 M |
| *Biotech Number of Financings* | 1 | 0 | 1 | 5 | 2 | 6 | 3 | 18 |
| All Industries VC Raised | $92.6 M | $267.7 M | $162.4 M | $299.8 M | $557.5 M | $1,305.6 M | $152.7 M | $2,838.4 M |
| *All Industries No. of Financings* | *29* | *26* | *32* | *44* | *55* | *80* | *20* | *286* |
| Biotech VC / Total VC | | | | | | | | 7% |

Source: Venture Capital and Number of Financings data from VentureSource's VentureOne database. Compilation by Ernst & Young LLP. Estimates are for calendar years shown, except 2001 through Fall 2001. Biotech Venture Capital Raised shows private sector financings of biopharmaceutical companies headquartered in Connecticut. Financings include those from professional venture capital firms, corporate investors and other private sources, but exclude funds from government sources. Financings also exclude public offerings, acquisitions and buyouts.

### *2. Government Funding Programs*

Connecticut has two main state organizations: Connecticut United Research Excellence (CURE), a membership group, and Connecticut Innovations, which provides some funding to biotechnology companies. The State can also offer direct financial assistance to biotechnology companies on a case-by-case basis through the 'Manufacturing Assistance Act.'

The *Connecticut United for Research Excellence, Inc.* group, with help from the *Connecticut Department of Economic and Community Development (DECD)*, assists the biotechnology industry in the state. CURE is a member funded, statewide coalition of bioscience companies, health-related organizations and supporting agencies and businesses.

In 1998, in concert with the DECD, the *Bioscience Cluster* was formed to help promote the biotechnology industry within Connecticut. The purpose of the cluster is to provide an organizational framework for the biotechnology industry to discuss policies and issues that may affect the industry throughout the state as well as to provide a networking forum. It is not a funding organization. The state established the cluster with $300,000 that was matched with $700,000 from the bioscience industry. Other than the initial amount of funding, the state has not provided any financial assistance to the bioscience cluster.

The *Connecticut Innovations Group*, a quasi-public company, offers below market loans, as well as equity investments in all technological fields. Although the company is privately funded, some of its programs have received state funding. With the exception of the funding CT Innovations has received from the state of Connecticut for its Bioscience Facilities fund, described below, the group operates completely independent of the state government.

**Summary of Connecticut State Biotech Funding Initiatives**

| Name | Type | Size of Investments | Total Disburse-ments | Co-investor match | Biotech Specific | State Specific | Other | Source of Funding | Management |
|---|---|---|---|---|---|---|---|---|---|
| Bioscience Facilities Fund | Majority Loan Program | Vary | $20 - 22 million | No | Yes | Yes | | State budget and private | Private |
| Connecticut BioSeed Fund | Convertible Bonds | Up to $500,000 | N/A | No | Yes | Yes | Brand new program | State budget and private | Private |

a. Government Supported Venture Capital

E&Y research found no government supported venture capital initiatives in Connecticut, though there are some programs that provide loans and other forms of financial assistance. These are described in the following sections.

b. Government Grants and Loans

The *Bioscience Facilities Fund* is the investment fund of the Connecticut Innovations Group. The fund has received government money totaling $60 million since its inception in 1998. The Fund offers biotechnology companies below-market loans to invest in wet laboratory space. Although the group will invest in other ways, such as convertible debt or an equity-debt combination, the majority of funds disbursed through the program are through loans, with loan arrangements made specific to each project and an average loan life of about 10 years. Since its inception, the fund has disbursed more than $20 million, with $6 to $7 million being disbursed in 1999 and the remainder in 2000. The success of this program is hard to determine given its relatively short existence.

The *Connecticut BioSeed Fund*, also a Connecticut Innovations Group program, is a new program created with the goal of funding start-up biotechnology companies. The fund invests through convertible bonds that are converted to preferred stock with the entry of new investors in later stages. The fund currently expects to disburse up to $5 million per year, with a maximum of $500,000 per investment.

Through the 'Manufacturing Assistance Act,' the State of Connecticut offers financial assistance to start-up companies. In spite of the law's title, financial assistance from the state may be given to any start-up company, including biotechnology companies, not just those engaged in manufacturing. The assistance the state offers through this law varies case-by-case, and can take any form, including an equity stake, below market rate loans or convertible debt.

c. Other Government Funding

Other notable funds that are part of the Connecticut Innovations Group are the *Yankee Ingenuity Fund* and the *Technology Scholar* program, neither of which are aimed specifically at biotechnology companies.

The *Yankee Ingenuity Technology Competition* program offers grants of up to $300,000 to academic investigators for university research with the potential of commercialization. The investigator can only receive the grant if he/she has formed a corporate partnership. The Yankee Ingenuity fund program totals approximately $4 million per year. If commercialization of a product occurs, Connecticut Innovations receives a negotiated percentage of the royalties received.

Finally, the *Technology Scholar* program offers scholarship grants to students who study in the technology field and are subsequently employed in technology fields within the state of Connecticut. If the student should leave the state for another job opportunity, he/she must repay the grant.

## Georgia

### *1. Private Venture Capital*

**Georgia Biotechnology Industry Private Venture Capital Funding**
**Dollars in Millions**
***(Number of Financings in Italics)***

| | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | Total |
|---|---|---|---|---|---|---|---|---|
| Biotech Venture Capital Raised | $0.5 M | $13.8 M | $2.7 M | $5.5 M | $57.9 M | $29.5 M | $7.4 M | $117.3 M |
| *Biotech Number of Financings* | *1* | *1* | *2* | *2* | *3* | *4* | *1* | *14* |
| All Industries VC Raised | $158.5 M | $219.3 M | $272.1 M | $426.0 M | $952.3 M | $1,864.7 M | $429.9 M | $4,322.8 M |
| *All Industries No. of Financings* | *27* | *48* | *60* | *59* | *103* | *157* | *35* | *489* |
| Biotech VC / Total VC | | | | | | | | 3% |

Source: Venture Capital and Number of Financings data from VentureSource's VentureOne database. Compilation by Ernst & Young LLP. Estimates are for calendar years shown, except 2001 through Fall 2001. Biotech Venture Capital Raised shows private sector financings of biopharmaceutical companies headquartered in Georgia. Financings include those from professional venture capital firms, corporate investors and other private sources, but exclude funds from government sources. Financings also exclude public offerings, acquisitions and buyouts.

### *2. Government Funding Programs*

In Georgia, funding of technology projects, including biotech, is managed through the Georgia Research Alliance (GRA), which focuses on universities rather than private companies. Funding occurs through grants, although the state refers to them as 'investments' since they expect returns in the long run. Funding amounts are submitted to the Georgia state legislature who must approve it through the state budget process. There is no funding through any state-run venture capital funds. Georgia intends to use $300 to $400 million of the tobacco settlement money to help with funding.

**Summary of Georgia State Biotech Funding Initiatives**

| Name | Type | Size of Investments | Total Disburse-ments | Co-investor match | Biotech Specific | State Specific | Other | Source of Funding | Management |
|---|---|---|---|---|---|---|---|---|---|
| Technology Development Partnership | Grant | Variable | $2.5 million | Yes – 1:1 | No | Yes | | State Budget; Annual | Privately managed, although state funded |
| Research Infrastructure Development Program | Grant | Variable | $189 million | No | No | Yes | | State Budget; Annual | Privately managed, although state funded |
| Eminent Scholar Program | Grant | Variable | $14.25 million | Yes – 1:1 | No | Yes | | State Budget; Annual | Privately managed, although state funded |
| Georgia Cancer Coalition | Grant | Variable | Expected to be $1 billion | No | No | Yes | Brand new initiative | State Budget; Tobacco Funds | Privately managed, although state funded |

a. Government Supported Venture Capital

No government supported venture capital initiatives were identified in Georgia.

b. Government Grants and Loans

No government grant or loan programs for private companies were identified.

c. Other Government Funding

Created in 1990, the *Georgia Research Alliance* is a strategic partnership that brings together Georgia's research universities, businesses and state government to promote technology. Although the group's employee salaries and administrative costs are privately funded, the programs it offers are funded through the state budget. Working through three main programs -- the *Technology Development Partnership*, the *Research Infrastructure Development Program* and the *Eminent Scholar Program* -- the Alliance has awarded approximately $205 million since 1995, with almost $100 million awarded to companies in the biotechnology industry. GRA will help any high-technology oriented project receive funding, not just biotechnology, and most of GRA's funding is directed towards universities, primarily Emory University, Georgia State University, University of Georgia, Georgia Tech and the Georgia Institute of Technology.

The *Technology Development Partnership* funds university and industry partnerships aimed at commercializing technology. Established in 1997, the partnership makes investments in university-based and research projects that are aimed at developing or improving products or processes useful for industry. Since its inception, the program has invested $2.5 million with annual investments of $500,000 to $750,000. A minimum of 1:1 matching funds from private industry is required in order to receive funding through this program.

The *Research Infrastructure Development Program* is intended to encourage the collaborative use of research infrastructure by industry. There are two components of this program in which the GRA can invest: facilities and equipment. The facilities component is intended to fund construction of new research facilities and/or the renovation or build-out of existing research facilities. Since 1995, the facilities portion has disbursed funds for projects ranging from $845,000 to $31 million, with total disbursements of approximately $67 million. The equipment investment component is intended for the purchase of specialized state-of-the-art equipment and instrumentation to be used to conduct applications-based research by collaborative teams of researchers led by one of the member universities. This portion of the program has increased from $10 million in 1995 to $31.5 million in 2000, with investments during that time totaling $121 million. In total, the Research Infrastructure Development Program has invested around $189 million since 1995.

The *Eminent Scholar Program* is an endowment program designed to help expand, as well as retain, the number of Eminent Scholars in Georgia's research universities. The program requires a 1:1 match by the private sector, and matching can take any form, including direct cash or in-kind payments. By investing in world class scholars, the state believes that new research funding will be brought in, which in turn will help to attract and retain additional eminent scholars as well as world class students. The funding for this program varies by year. Since 1995 endowments have ranged from $1.5 million to more than $3 million with a total disbursement equaling $14.25 million. In the Governor's 2001 budget, $4 million in matching endowments have been set aside.

The Governor's office recently announced a new *Georgia Cancer Coalition*. The Coalition will bring together Georgia's hospitals and universities, biotechnology firms, civic groups and non-profit and government agencies. The Coalition will begin under the jurisdiction of the Georgia Research Alliance with the intent of spinning it off into its own private entity. The purpose of the Coalition will be to coordinate development of a world-class, comprehensive cancer control program. It has been budgeted $300 to $400 million from *tobacco settlement funds*, and the state believes that it will eventually become a $1 billion entity with further funds coming from the federal government and private investment. While the expected 60% private funding will go toward investments in pharmaceutical and biotechnology companies, the public funds will be used to make grants to Georgia universities and medical centers. This initiative is not exclusively focused on biotechnology, but there will likely be biotech aspects to it.

## Massachusetts

### *1. Private Venture Capital*

**Massachusetts Biotechnology Industry Private Venture Capital Funding**

**Dollars in Millions**

***(Number of Financings in Italics)***

| | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | Total |
|---|---|---|---|---|---|---|---|---|
| Biotech Venture Capital Raised | $189 M | $193 M | $249 M | $286 M | $156 M | $544 M | $302 M | $1,919 M |
| *Biotech Number of Financings* | *28* | *32* | *32* | *32* | *30* | *48* | *25* | *227* |
| All Industries VC Raised | $467 M | $977 M | $2,083 M | $2,175 M | $4,732 M | $9,458 M | $1,576 M | $21,467 M |
| Biotech VC / Total VC | | | | | | | | 9% |

Source: Venture Capital and Number of Financings data from VentureSource's VentureOne database. Compilation by Ernst & Young LLP. Estimates are for calendar years shown, except 2001 through Fall 2001. Biotech Venture Capital Raised shows private sector financings of biopharmaceutical companies headquartered in Massachusetts. Financings include those from professional venture capital firms, corporate investors and other private sources, but exclude funds from government sources. Financings also exclude public offerings, acquisitions and buyouts.

### *2. Government Funding Programs*

**Summary of Massachusetts State Biotech Funding Initiatives**

| Name | Type | Size of Invest-ments | Total Disburse-ments | Co-investor match | Biotech Specific | State Specific | Other | Source of Funding | Manage-ment |
|---|---|---|---|---|---|---|---|---|---|
| MTDC Traditional Investment Fund | Venture capital | $250K to $500K | | No | No | Yes | | Originally state; today private | Public |
| MTDC Common-wealth Fund Investment Program I | Venture Capital | $300K to $600K | | No | No | Yes | | Both state / Private | Private |
| MTDC Common-wealth Fund Investment Program II | Venture Capital | $300K to $600K | | No | No | Yes | | Both state / Private | Private |
| Massachusetts Biomedical Initiatives | Venture Capital | -- | $8 mil | No | Yes | Yes | No longer investing | Both state / Private | Public / Private |
| Emerging Technology Fund (ETF) | Loan | Upto $500K -$2.5M or 1/3 of total debt | N/A | N/A | No | Yes | | Both state / Private | Public / Private |
| Emerging Technology Fund (ETF) | Loan Guarantee | Up to $1.5 mil or ½ of total debt | N/A | N/A | No | Yes | | Both state / Private | Public / Private |
| Mass- | Loan | $50K to $3 | N/A | No | No | Yes | | Both state | Public / |

| Name | Type | Size of Invest-ments | Total Disburse-ments | Co-investor match | Biotech Specific | State Specific | Other | Source of Funding | Manage-ment |
|---|---|---|---|---|---|---|---|---|---|
| Development Business Loans | | mil | | | | | | / Private | Private |
| Mass-Development Real Estate Loan Program | Mortgage Loan | Up to $3 mil | N/A | No | No | Yes | | Both state / Private | Public / Private |
| Mass-Development Development Loan | Loan | Up to $400K or ½ of development costs | N/A | No | No | Yes | | Both state / Private | Public / Private |
| Mass-Development Taxable Industrial Development Bond Program | Loan | Variable, and unlimited. | N/A | N/A | N/A | N/A | | Both state / Private | Public / Private |
| Mass-Development Equipment Loans | Loan | $50K to $500K | N/A | No | No | Yes | | Both state / Private | Public / Private |

a. Government Supported Venture Capital

The *Massachusetts Technology Development Corporation* was established in 1978 through state legislation to address the "capital gap" for start-up and expansion of early-stage technology companies. From 1980 through June 30, 2000, MTDC's total cumulative investments from all of its investment programs exceeded $45 million in 100 companies. Approximately 17 percent of this amount has been invested in biomedical companies, mostly in medical instruments companies.

MTDC was launched with an operating budget from Massachusetts and $3 million in investment capital from the federal government. The Commonwealth added $5.2 million in investment funds from 1981 to 1988. Since then, the returns from investments have enabled MTDC to self-finance its operations and to increase its capital base from the initial $8.2 million to $37.2 million. The internal rate of return on MTDC's entire portfolio since 1980 is 18.6%.

The size of MTDC's *Traditional Investment Fund Program* initial funding is determined by an applicant's capital needs and the investment by co-investors. Though initial investments can range up to a maximum of $500,000, most are typically in the $250,000 to $500,000 range.

Investments are made primarily as equity where MTDC will purchase preferred or common stock of a company. These investments carry the same rights and privileges as are afforded the other shareholders and co-investors. MTDC may also offer long-term, unsecured, subordinated debt. As a condition of providing favorable debt financing, MTDC seeks an equity participation that is fair and reasonable when compared to the investment being made by the co-investors.

In 1995, MTDC launched the *Commonwealth Fund Investment Program I*, a $5 million fund. In 2000, MTDC closed $15 million in the Commonwealth Fund Investment Program II. MTDC committed $12 million to Program II and was joined by BancBoston Investments, Inc. for $2 million and the Essex Regional Retirement Board for $1 million.

The Program makes initial investments, generally ranging from $300,000 to $600,000, in early-stage technology companies located in Massachusetts. The purposes of the Program are to provide risk capital to fund the continued growth of businesses, helping create jobs, and to provide the opportunity for attractive financial returns to co-investors.

The *Massachusetts Biomedical Initiatives* was formed as a public/private partnership for accelerating commercial development in the biomedical field. To date, MBI and its former venture capital creation, Commonwealth BioVentures Inc., have invested over $8 million of public funding and over $50 million of private money in new technology driven companies. These companies have gone on to raise $600 million in additional funding, which has helped fuel to economic growth of the Central Massachusetts region. At the present time, MBI is not investing, but acts as a liason between start-up companies and venture capital firms. MBI advises companies on the steps to funding and helps them prepare their proposals. MBI will also provide feedback to companies on behalf of the venture capital firms if any additional issues need to be addressed.

b. Government Grants and Loans

*MassDevelopment* is a quasi-public agency that was formed from the merger of the Massachusetts Government Land Bank and Massachusetts Industrial Finance Agency. MassDevelopment serves as the state's economic and real estate development bank and seeks to achieve the following objectives through its programs: the creation of new employment opportunities and/or the retention of existing jobs; the rehabilitation of blighted property and the prevention of the spread of blight in a community; the generation of incremental property tax revenue for Massachusetts cities and towns; the attraction of new capital investment in plant and equipment; the diversification of the local economy and the broadening of the local employment tax base; and the financing of projects which are likely to stimulate additional local investment. The agency seeks to participate with local lending institutions through co-lending, participation or take-out financing. Since 1995, the agencies comprising MassDevelopment have completed 459 projects throughout the state with investments totaling more than $2 billion. It is among the state's leading issuers of bonds, utilizing both public and private sources to provide more than $10 billion in tax-exempt bonds for more than 2,600 projects.

MassDevelopment's *Emerging Technology Fund (ETF)* is designed to stimulate increased financing for any technology-based company looking to expand, with focus on biotechnology, medical, telecommunications, advanced materials, electronics and environmental industries or real estate developers developing facilities for the foregoing. The fund offers two products to businesses: a direct loan and a loan guarantee. The maximum loan amount for facilities is $2.5 million or 33 1/3% participation of the aggregate debt, whichever is less. The maximum loan amount for equipment is $500,000 or 33 1/3% of the participation of the aggregate debt, whichever is less. The maximum guarantee amount is $1.5 million or 50% participation of the aggregate debt, whichever is less. Guarantees may be issued for up to 10 years. Annual fees

ranging from 3% to 5% are collected based on the balance outstanding of the guarantee. Equity participation in the form of warrants or stock in the company securing the guarantee may be required. Loans run co-terminus with the participating lenders for up to 7 years. Interest rates are typically fixed-rate for the term of the loan.

MassDevelopment's *Business Loans* are targeted at companies that create or retain jobs. All industrial, commercial and service firms are eligible. Direct loan amounts range from $50,000 to $3 million. Loans will be fixed or floating at the prime rate plus a premium. The maximum term is 10 years for real estate loans and 7 years for equipment loans. Real estate may be amortized for up to 25 years. The agency may require collateral on the loans.

MassDevelopment's *Real Estate Loan Program* provides permanent mortgage financing for multi-tenant, commercial, industrial or retail projects and construction financing for industrial park projects. The maximum loan amount is $3 million and the maximum term is 10 years. Maximum amortization is 25 years, minimum equity contribution is 10%, and maximum loan-to-value is 90%. For industrial parks, repayment is based on a percentage of each parcel of land's sale price. The percentage varies between 75% and 90%. Interest rates are generally fixed or floating at prime plus a premium.

In an effort to promote a transition from concept to deal, MassDevelopment offers the *Development Loan* to borrowers who need assistance in advancing the final stages of their project prior to permanent loan financing or are delayed due to other funding mechanisms. The maximum loan amount is $400,000 or 50% of the total eligible development costs remaining, whichever is less, inclusive of any prior outstanding MassDevelopment predevelopment awards.

MassDevelopment also has a *Taxable Industrial Development Bond* program it offers. It is well suited to major industrial and commercial real estate projects, particularly for companies that can no longer gain access to tax-exempt financing. The uses for the bonds include research and development, and economic development projects. Taxable bonds be either fixed or variable rate, and can be structured either as public offerings or as private placements.

Finally, MassDevelopment provides direct *Equipment Loans* to Massachusetts companies for the purchase of new manufacturing equipment. Loan amounts range from $50,000 to $500,000 and the loans van be fixed or floating at rates below prime. Terms can be 3, 5 or 7 years. Maximum loan-to-value is 85%, based on the purchase price of the equipment.

## Michigan

### *1. Private Venture Capital*

**Michigan Biotechnology Industry Private Venture Capital Funding**
**Dollars in Millions**
***(Number of Financings in Italics)***

| | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | Total |
|---|---|---|---|---|---|---|---|---|
| Biotech Venture Capital Raised | $10.0 M | $9.5 M | $3.7 M | $29.2 M | $9.9 M | $60.5 M | $0.5 M | $123.2 M |
| *Biotech Number of Financings* | *1* | *2* | *2* | *5* | *3* | *7* | *1* | *21* |
| All Industries VC Raised | $45.1 M | $57.2 M | $32.2 M | $69.9 M | $91.2 M | $374.8 M | $67.5 M | $737.8 M |
| *All Industries No. of Financings* | *10* | *16* | *14* | *13* | *19* | *37* | *8* | *117* |
| Biotech VC / Total VC | | | | | | | | 3% |

Source: Venture Capital and Number of Financings data from VentureSource's VentureOne database. Compilation by Ernst & Young LLP. Estimates are for calendar years shown, except 2001 through Fall 2001. Biotech Venture Capital Raised shows private sector financings of biopharmaceutical companies headquartered in Michigan. Financings include those from professional venture capital firms, corporate investors and other private sources, but exclude funds from government sources. Financings also exclude public offerings, acquisitions and buyouts.

### *2. Government Funding Programs*

**Summary of Michigan State Biotech Funding Initiatives**

| Name | Type | Size of Investments | Total Disbursements | Co-investor match | Biotech Specific | State Specific | Other | Sources of Funding | Manage-ment |
|---|---|---|---|---|---|---|---|---|---|
| Sloan Ventures Catalyst Fund | Loans – Convertible to common stock | Up to $150,000 | $150,000 | No | Yes | Yes | | Life Science Corridor; Tobacco | Private |
| Life Sciences Corridor | Loans, Royalties, Grant, Equity | Varies; total annual investments upto $50 mil | $150 million through 2001 | Yes; no set ratio | Yes | Yes | | State Budget; Tobacco Settlement | Private |
| Capital Access | Loan Assistance/ guarantee | N/A | N/A | Yes | No | Yes | | State Budget; Annual | State |

In Michigan, state sponsored biotechnology funding is run by an initiative formed in 1999 called the Life Sciences Corridor. The funding for the Corridor, totaling $1 billion, will come from the state's tobacco settlement. With funding from the Life Sciences Corridor, a new venture capital fund has been created.

a. Government Supported Venture Capital

In August 2001, Sloan Ventures, a private venture capital firm located in Birmingham, Michigan, was given $843,000 by the state-funded Life Sciences Corridor to invest in very early stage start-up biotechnology companies in a program called the *Sloan Ventures Catalyst Fund*. The funds were given with several restrictions; however, Sloan did not have to match the funds in any way. The money must be used through the fund for seed stage investments, and the purpose of the investments must be one that breeds immediate results. The state expects Sloan to use the money to accelerate a company's growth to a point where investors are less cautious about investing. Sloan was chosen because it is the only venture capital firm who invests at the seed stage in Michigan.

Although a venture capital firm, Sloan does not expect to disburse the funds as typical venture capital. Instead, the firm expects to disburse amounts ranging up to $150,000 in the form of convertible debt (common stock) payable over two years at a rate of 6%. The expectation is that although not specifically venture capital, the initial $150,000 investment will be quickly followed by $1 to $2 million in venture capital, from Sloan Ventures and others.

b. Government Grants and Loans

No government loan or grant programs for biotechnology companies were identified.

c. Other Government Funding

The biggest initiative enacted by the state is the *Life Sciences Corridor*. The Life Sciences Corridor is designed to bolster the biotechnology industry in Michigan. The organization has been allotted a total of $1 billion over the course of 20 years, and this money is expected to come from the state's tobacco settlement. In 2000, the Corridor disbursed approximately $100 million, although it expects to decrease this amount to $50 million per year going forward. In 2000, approximately $80 million was disbursed to the public sector, mostly universities, and roughly $20 million was disbursed to the private sector. The Life Sciences Corridor invests in all stages of bioscience, and investments can take many forms including deferred loans, convertible issues, royalties and grants. For-profit institutions receive funds with financing arrangements other than grants. The disbursement agreement is dependent on the individual project, and the agreement is formed in order to accommodate the company or project specifically, with awards typically lasting no more than three years. Funding will only occur if the company applying has matching funds, although there is no set proportion or way in which the funds must be met. Grants are only issued to Michigan universities and Michigan not-for-profit research institutes.

The *Capital Access Program* is designed to help banks hedge risky loans made to start-up companies in the state. Although not specific to biotechnology, the program contains elements of the industry within it. The manner in which the program works is that the bank loans money to a company that is typically a higher than average risk. On average these loans range from $50,000 to $60,000. The bank enrolls a loan as part of the Capital Access Program, and would

create a reserve account. The bank then deposits a percentage of the loan, usually between 1.5% and 3.0% into this reserve account, and the Michigan Department of Economic Development matches this amount with a deposit of its own. The bank can then use this reserve account to protect against any loan defaults.

Michigan has recently started the *Michigan Commercialization Program*. The initiative is a program that offers consultants, contracted through the state, who offer commercialization training, focusing on helping people understand how to apply for federal grants. In addition, they offer one-to-one meetings with new companies to offer assistance in actually getting started. From these new companies, they select a subset to provide additional help. There are no actual funding opportunities through this program.

## New Jersey

### *1. Private Venture Capital*

**New Jersey Biotechnology Industry Private Venture Capital Funding**
**Dollars in Millions**
***(Number of Financings in Italics)***

| | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | Total |
|---|---|---|---|---|---|---|---|---|
| Biotech Venture Capital Raised | $36.9 M | $7.1 M | $21.7 M | $91.7 M | $106.7 M | $110.1 M | $57.4 M | $431.6 M |
| *Biotech Number of Financings* | *8* | *3* | *10* | *11* | *5* | *11* | *4* | *52* |
| All Industries VC Raised | $197.8 M | $338.4 M | $395.2 M | $389.6 M | $826.5 M | $3,217.7 M | $290.5 M | $5,655.7 M |
| Biotech VC / Total VC | | | | | | | | 8% |

Source: Venture Capital and Number of Financings data from VentureSource's VentureOne database. Compilation by Ernst & Young LLP. Estimates are for calendar years shown, except 2001 through Fall 2001. Biotech Venture Capital Raised shows private sector financings of biopharmaceutical companies headquartered in New Jersey. Financings include those from professional venture capital firms, corporate investors and other private sources, but exclude funds from government sources. Financings also exclude public offerings, acquisitions and buyouts.

### *2. Government Funding Programs*

**Summary of New Jersey State Biotech Funding Initiatives**

| Name | Type | Size of Investments | Total Disburse-ments | Co-investor match | Biotech Specific | State Specific | Other | Source of Funding | Manage-ment |
|---|---|---|---|---|---|---|---|---|---|
| New Jersey Technology Council Venture Fund | Venture Capital Fund | Initially from $250k to $1.5 million, ranges from $2-$3 million over course of partnership | $30 Million | No | No – all tech | Yes | | State budget and private sources; Annual | Private |
| Early Stage Enterprise Fund | Venture Capital | $500k – $1 mil | N/A | No | No – all tech | No | | Private | Private |
| SEED Capital Program | Loan Program | Range from $25k to $500k | N/A | No | No – all tech | Yes | Very new program | State budget; Annual | Public |
| Springboard Fund | Repayable Grant | $50k - $250k | $5 Million Annually | Yes- 1:1 | No – all tech | Yes | Very new program | State budget; Annual | Private |
| NJ Technology Funding Program | Joint Loan Program | Range from $100K to $5 million; However the NJEDA portion may be up to $250K for working capital & $500K for fixed assets. | N/A | No | No – all tech | Yes | | Public / Private; Annual | State / Private |

The state of New Jersey has several state sponsored programs and venture funds, none of which are biotechnology specific. Funding for these comes from the state through the New Jersey Commission on Science and Technology, created in 1985, or the New Jersey Economic Development Authority (NJEDA).

a. Government Supported Venture Capital

The *New Jersey Technology Council Venture Fund* is a recently formed venture capital fund that focuses strictly on early stage technology companies having less than $5 million in revenue. At least 75% of the Fund's investments will be made in companies based in New Jersey. The fund does not invest solely in biotechnology companies. Initial investments typically range from $250,000 to $1.5 million, with total investments in a single company expected to range from $2 to $3 million. The fund will typically designate a member of the portfolio company's board of directors, although these individuals do not serve to play an operational role, they serve as counselors on strategic or other major decisions. The state has contributed $10 million into the fund, which totals $30 million, with the difference coming from private investors. The fund is

also licensed as a Small Business Investment Company (SBIC), and is eligible to receive up to $2 from the Small Business Administration for each $1 the fund has.

The *Early Stage Enterprise Fund* is a private venture capital firm licensed as an SBIC that was organized to provide capital and guidance to early stage companies in the Mid-Atlantic region. The New Jersey state government plays no role in the management of the fund or the companies in which it invests. The State has provided the fund with approximately $4.3 million since its inception in 1996. The fund has also received $10.5 million in private investment and $29.5 million in leverage from the SBA Investments from the program range from $500,000 to $1 million and are available to all technology companies in the region.

b. Government Grants and Loans

The *SEED Capital Program* is a loan program overseen by the New Jersey Economic Development Authority (NJEDA). The approval process consists of submitting an application along with a detailed business plan to the NJEDA which then reviews it for eligibility requirements. Once reviewed by the NJEDA, the application is sent to the Technology Advisory Board which evaluates the technology. Once approved by the Board, the application is passed back to the NJEDA which offers final approval. The total process takes approximately 90 to 120 days. The financing package is a market rate loan with a payment period of up to 5 years. The loans typically range anywhere from $25,000 to $500,000, with a $250,000 cap on the working capital portion of the loan. In addition, repayment terms can vary to include royalties and warrants. The program targets businesses that have already established an emerging technology and require seed capital to bring the product to market. The program is not solely geared toward biotechnology.

The *Springboard Fund* is a new repayable grant program overseen by a private group of managers and administered through the New Jersey Commission on Science and Technology. The grant approval process is conducted at quarterly meetings, where industry experts review the applications and examine the potential impact on the economy and job market. Fund managers then meet with the investment committee in order to make a final decision. The prime goals of the fund are to promote economic growth in the state while making sure that all loans are repaid. Grant amounts can range from $50,000 to $250,000 and the fund expects to disburse approximately $5 million per year. Repayment period of the grants typically range from 3 to 4 years and only small (less than 500 employees), high technology firms are eligible for a loan. In addition, a 1:1 match of funds from a non-state entity is required, although the match may be in the form of cash or in-kind support.

c. Other Government Funding

The *NJ Technology Funding Program* is a joint loan program overseen by NJEDA. The program attempts to bring second and third stage companies in contact with potential lender banks. The program acts as an intermediary between the company and the bank, and will take measures to assure the bank that company will repay the loan. The loans are made to companies at the market rate from the bank, with any funds provided by the program at below the market rate. Loans range from $100,000 to $5 million from the commercial bank side and up to $250,000 from the

NJEDA for working capital and $500,000 for fixed assets. The loans are available to all technology companies in the state of New Jersey.

## New York

### *1. Private Venture Capital*

**New York Biotechnology Industry Private Venture Capital Funding**
**Dollars in Millions**
***(Number of Financings in Italics)***

| | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | Total |
|---|---|---|---|---|---|---|---|---|
| Biotech Venture Capital Raised | $12.2 M | $9.4 M | $23.6 M | $24.5 M | $10.1 M | $93.7 M | $117.2 M | $290.6 M |
| *Biotech Number of Financings* | *3* | *3* | *4* | *3* | *2* | *4* | *3* | *22* |
| All Industries VC Raised | $178 M | $499 M | $859 M | $1,451 M | $5,373 M | $6,803 M | $881 M | $16,042 M |
| Biotech VC / Total VC | | | | | | | | 2% |

Source: Venture Capital and Number of Financings data from VentureSource's VentureOne database. Compilation by Ernst & Young LLP. Estimates are for calendar years shown, except 2001 through Fall 2001. Biotech Venture Capital Raised shows private sector financings of biopharmaceutical companies headquartered in New York. Financings include those from professional venture capital firms, corporate investors and other private sources, but exclude funds from government sources. Financings also exclude public offerings, acquisitions and buyouts. All Industries VC Raised data is from National Venture Capital Association / VentureExpert.

## *2. Government Funding Programs*

**Summary of New York State Biotech Funding Initiatives**

| Name | Type | Size of Investments | Total Disburse-ments | Co-investor match | Biotech Specific | State Specific | Other | Sources of Funding | Management |
|---|---|---|---|---|---|---|---|---|---|
| Small Business Technology Investment Fund | Venture Capital | $350k – $500k | $4 million per year | 3 – 1 | No – all tech | Yes | | Originally state, now private | Private |
| Emerging Industries Fund | Venture Capital | $250k – $1.5 Mil | $600,000 | No | No – all tech | Yes | Specific to New York City | State Budget; Annual | Private |
| Prospect Street NYC Discovery Fund | Venture Capital | $1 – $9 Mil | $61.6 million | No | No – all tech | Yes | Specific to New York City | State Budget; Annual | Public |
| Biotechnology Industry Growth Fund | Grants & Loans | Variable | $10 million | No | Yes | Yes | Established in 2000 | State Budget; Annual | Public |
| Center for Advanced Technology Program | State Grant | Up to $10 million | N/A | No | No – all tech | Yes | Can only go to public institutions. | State Budget; Annual | Public |
| Capital Facility Program Fund | State Grant | Typically: $200k – $15m | Up to $80 million per year | No | No – all tech | Yes | Can only go to public institutions. | State Budget; Annual | Public |
| Faculty Development Program | State Grant | Typically: $250k – $700k | Up to $7.5 million a year | No | No – all Tech | Yes | Can only go to public institutions. | State Budget; Annual | Public |
| Technology Transfer Incentive Program | State Grant | May range from $66K up to $500K | About $3 million | Yes 1:1 | No – all tech | Yes | Can only go to public institutions. | State Budget; Annual | Public |

### a. Government Supported Venture Capital

The *Small Business Technology Investment Fund* is a venture capital fund that typically invests in emerging high technology and biotechnology firms. The fund received state funding until 1995, at which time it became self-sustaining. The fund receives rights similar to other investors and also has board visitation rights. Typical investments through this fund range from $50,000 to $500,000 and annually the program disburses approximately $4 million. In addition any company receiving funds through this program must match 3:1 from sources other than the state. The fund's return on investment is approximately 18 to 20%.

The *Emerging Industries Fund* is a New York City specific program designed to address the need for early stage financing of small, fast-growing New York City-based technology

companies. The New York City Department of Economic Development administers the fund.. Investments range from $250,000 to $1.5 million and are structured through two private equity venture firms: Draper Fisher Jurveton Gotham Ventures and Paramount Capital. While the fund offers investments for the entire technology industry, Paramount Capital only handles investments in biotechnology companies. Investments through the fund are expected to total $25 million. As of August 2001, total investments had only reached $600,000.

The *New York City Discovery Fund* is also a program specific to New York City. Initially capitalized with $75 million from the New York City Economic Development Corporation as well as other public and private investors, the fund invests from $1 to $9 million in growing New York City-based businesses engaged in the development, production, commercialization and use of a wide range of advanced technologies. Since its inception in 1995, the fund has invested approximately $61.6 million. The fund invests at all stages of development, from seed stage to pre-IPO rounds.

In 1999, New York State Comptroller Carl McCall created the New York State Venture Capital Investment Program as part of the state's Common Retirement Fund (CRF) in conjunction with the State's Jobs 2000 Act. The CRF is the second largest public pension fund in the country with $127 billion in assets, of which up to $250 million was committed to the Venture Capital Investment Program. The program provides for investments to be made through a partnership, in which the general partner seeks out the investment, reviews the business plan, negotiates the terms and monitors progress. In addition, the partner must match the program's investment funds on a minimum 1:1 basis. The program invests in a variety of industries and companies in a variety of stages of development.

b. Government Grants and Loans

The *Biotechnology Industry Growth Fund* is a state run fund that provides investment capital to start-up bioscience companies. The fund is split between the *New York State Office of Science, Technology, and Academic Research* (NYSTAR) and the Empire State Development group. The fund began last year with $10 million dollars. It disburses funds through capital grants and below market rate bans. Capital grants are disbursed based on the number of jobs the project is expected to create, and not all funds promised are always paid out in one lump sum. The Empire State Development sets up job creation milestones, which trigger further fund disbursements. Loans provided through the fund are at below market interest rates and do not have as much focus on the job creation aspect. The funds are to be used at nearly any stage of development, other than for very early, seed/pre-seed stages.

c. Other Government Funding

The *Centers for Advanced Technology* (CAT) Development Program is a program run through NYSTAR. The program, which started in 1983, is used to fund expansion and enhancements of the research and economic development efforts of selected CAT's. CAT's are centers where research collaboration between universities and industries takes place. For fiscal year 2001, up to $10 million is expected to be awarded in the form of 3 to 5 awards with funds to be spent over

a maximum of 2 years. Actual award amounts vary based on budget proposals that are submitted along with an application.

The *Capital Facility Program Funds* is a program also run through NYSTAR. The program is designed to fund new facilities, rehabilitate older facilities and/or acquire state of the art technology and research equipment. Up to $80 million annually may be awarded to support the design, acquisition, construction, reconstruction, rehabilitation or improvement of research and development facilities, with no more than $25 million going to one group. In addition, up to $15 million may be awarded to provide financing for the reconstruction, rehabilitation or improvement of existing laboratory facilities. Funds from the $80 million pool are used to establish *Strategically Targeted Academic Research* (STAR) Centers, while funds from the $15 million pool may be awarded to institutions that are designated STAR centers. Up to six awards are given each year. Additionally, only institutions that have a *Center for Advanced Technology* (CAT) may be eligible for an award from the $80 million pool.

The *Faculty Development Program* is a funding program closely linked to the Capital Facility Program. The program is used to fund research by a faculty members. Priority consideration is given to those applicants that link this application with the NYSTAR Capital Facility Program. In addition, although funds may be used for both recruitment and retention, priority is given to recruitment. For fiscal year 2001 awards up to $7.5 million were granted. No single award however can exceed $1 million, and the number awards given is determined by the availability of funds, the quality of proposals and the amount of funds awarded to individual projects. In addition, recipients are required to match funds with their own resources or those contributed by others. The matching criteria increases with duration of the award as well, so in year 1 the matching funds required are 1:1; in year 2, 1:1.25; in year 3, 1:1.5; in year 4, 1:1.75 and year 5, 1:2.

The *Technology Transfer Incentive Program* is a program that supports the efforts of New York's colleges and universities to commercialize high-tech innovations. This program was created in February 2000, and is funded from the state budget's general fund. Through this program, the state awards grants to public universities that have partnered with private companies in an effort to commercialize technology products. The awards require a 1:1 match from the companies; however the match may come in any form, including an in-kind payment. Awards through this program have historically ranged from $66,000 to $500,000, averaging around $200,000.

## North Carolina

### *1. Private Venture Capital*

**North Carolina Biotechnology Industry Private Venture Capital Funding**
**Dollars in Millions**
***(Number of Financings in Italics)***

| | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | Total |
|---|---|---|---|---|---|---|---|---|
| Biotech Venture Capital Raised | $26.7 M | $38.3 M | $50.7 M | $34.9 M | $91.7 M | $202.2 M | $53.8 M | $498.2 M |
| *Biotech Number of Financings* | *4* | *8* | *9* | *9* | *8* | *19* | *8* | *65* |
| All Industries VC Raised | $254.0 M | $209.1 M | $344.2 M | $264.6 M | $1,097.8 M | $1,465.1 M | $211.8 M | $3,846.7 M |
| *All Industries No. of Financings* | *32* | *51* | *67* | *62* | *88* | *107* | *23* | *430* |
| Biotech VC / Total VC | | | | | | | | 13% |

Source: Venture Capital and Number of Financings data from VentureSource's VentureOne database. Compilation by Ernst & Young LLP. Estimates are for calendar years shown, except 2001 through Fall 2001. Biotech Venture Capital Raised shows private sector financings of biopharmaceutical companies headquartered in North Carolina. Financings include those from professional venture capital firms, corporate investors and other private sources, but exclude funds from government sources. Financings also exclude public offerings, acquisitions and buyouts. All Industries data include financings in South Carolina, but North Carolina accounts for the vast majority of financings.

### *2. Government Funding Programs*

The *North Carolina Biotechnology Center*, created in 1984 by the state's General Assembly, is the nation's oldest state-sponsored biotechnology center. The center is funded mainly by the state General Assembly, which appropriated $10.6 million for the fiscal year 1999. Bipartisan legislative support for the center's targeted programs and activities has averaged $7 million annually for the past 15 years. The Center appears to play a key role in venture capital and financing for biotech start-ups in North Carolina.

**Summary of North Carolina State Biotech Funding Initiatives**

| Name | Type | Size of Investments | Total Disburse-ments | Co-investor match | Biotech Specific | State Specific | Other | Source of Funding | Management |
|---|---|---|---|---|---|---|---|---|---|
| BioScience Investment Fund | VC Fund | $500K - $2Mil | $30 million | 1:2 (govt.: pvt.) | Yes | Yes | | Public / private funds; One-time appropriation | Private |
| Investments in NC VC Firms | VC | No more than $200K; Typically $25-100K | $1.6 million through May '01 | None | No | Yes | | State Budget; Annual | Private |

| Name | Type | Size of Investments | Total Disburse-ments | Co-investor match | Biotech Specific | State Specific | Other | Source of Funding | Management |
|---|---|---|---|---|---|---|---|---|---|
| Small Business Research Award Program | Loan | $150K, w/ $100K for follow-on | N/A | N/A | Yes | Yes | | State Budget; Annual | Private |
| SBIR Bridge Loan | Loan | $75K | N/A | N/A | Yes | Yes | | State Budget; Annual | Private |
| Business Development Award Loan | Loan | $15K | N/A | N/A | Yes | Yes | | State Budget; Annual | Private |
| Proof-of-Principle Award Program | Loan | Up to $25K | N/A | N/A | Yes | Yes | | State Budget; Annual | Private |
| Collaborative Funding Awards | Grant | $15K by Center ($60K with matches) | N/A | 1:4 | Yes | Yes | | State and University funded; Annual | Joint between state and NC State |

a. Government Supported Venture Capital

*The North Carolina Bioscience Investment Fund* was created in 1997 to provide early stage capital for bioscience companies located in North Carolina. The fund was inaugurated with a $10 million appropriation from the legislature in response to a perceived shortfall in the availability of North Carolina early stage venture funding for biotechnology companies. The fund provides financing on a much larger scale than is available through the Biotechnology Center's loan programs.

The fund has successfully leveraged the state's investment to attract additional investment from private and institutional investors. The fund's goal was to leverage the state's investment three- to four-fold. To date, the state's $10 million investment has been supplemented by an additional $20 million in investments by private companies and foundations, including Bank of America, Wachovia, BB&T, the Burroughs Wellcome Fund, Tomen America and Quintiles Transnational Corp. The Fund is managed by Durham, NC-based Eno River Capital. The center played a proactive role in attracting outside investors to the fund. The fund is almost(?) fully subscribed. Eno River Capital is in the process of raising a second fund, though this fund will have no involvement with the Center and will not be restricted to biotechnology companies.

b. Government Grants and Loans

The North Carolina Biotechnology Center's Business and Technology Program has four loan programs for North Carolina based biotechnology companies. For the most part, these programs provide relatively small loans for early stage financing. Early on, the Center tended to make grants, but has found that the increase in accountability associated with from switching to loans has increased the survival and success of companies. The loans are typically at below-market interest rates for periods of seven years, and the Center is willing to restructure the loan if needed. The Center has considerable independence in the management and approval of loans,

with no direct government involvement or oversight. The Center does not assume a management role in the recipient companies. Companies receiving these loans have tended to be successful in subsequently raising other funding from venture capitalists.

- The Small Business Research Award Program: For "research lending to the development or refinement of a product or process with clear commercial potential." Loans are for $150,000 with $100,000 for follow-on funding. Earlier this year, the Center has started structuring some SBRA awards as debt convertible into equity.
- SBIR Bridge Loan: This loan program helps companies receiving funding under the federal government's Small Business Innovation Research Program to bridge the gap between SBIR funding phases.
- The Business Development Award Loan: Provides $15,000 loans for companies for commercialization of company research. Applicants are required to submit a business plan demonstrating a viable idea which is a useful exercise for companies at this stage.
- The Proof-Of-Principle Award Program: Funding for NC research institutions, through their technology transfer offices, to obtain $25,000 loans for final proof-of-research necessary for successful commercialization. Unlike the other three loans, this loan is awarded to technology transfer programs rather than to companies.

c. Other Government Funding

The *Science and Technology Development Program* administered by the North Carolina Biotechnology Center has provided more than 500 grants to North Carolina universities for institutional development and innovative research. The universities have received more than $600 million in follow-on grants from federal agencies.

The *Collaborative Funding Award* program is administered jointly by the Center and the Keenan Institute at North Carolina State University to facilitate academic-industry cooperation on research. Awards are in the form of two year grants to fund post-doctoral fellows or junior researchers at North Carolina companies. A total of $60,000 is awarded, in the form of a $15,000 grant from the Center, $15,000 from Keenan Institute, $15,000 from the company, and $15,000 in waived costs by the University. To encourage participation by smaller companies, there is an earlier deadline for companies with fewer than 50 employees, with larger companies only being eligible to apply for grants at a later deadline.

## Pennsylvania

### *1. Private Venture Capital*

**Pennsylvania Biotechnology Industry Private Venture Capital Funding**

**Dollars in Millions**

***(Number of Financings in Italics)***

| | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | Total |
|---|---|---|---|---|---|---|---|---|
| Biotech Venture Capital Raised | $45.5 M | $43.5 M | $55.5 M | $85.5 M | $50.2 M | $275.8 M | $57.4 M | $613.4 M |
| *Biotech Number of Financings* | *10* | *11* | *9* | *16* | *11* | *21* | *6* | *84* |
| All Industries VC Raised | $86 M | $372 M | $826 M | $518 M | $1,834 M | $2,114 M | $203 M | $5,951 M |
| Biotech VC / Total VC | | | | | | | | 10% |

Source: Venture Capital and Number of Financings data from VentureSource's VentureOne database. Compilation by Ernst & Young LLP. Estimates are for calendar years shown, except 2001 through Fall 2001. Biotech Venture Capital Raised shows private sector financings of biopharmaceutical companies headquartered in Pennsylvania. Financings include those from professional venture capital firms, corporate investors and other private sources, but exclude funds from government sources. Financings also exclude public offerings, acquisitions and buyouts. All Industries VC Raised data is from National Venture Capital Association / VentureExpert.

### *2. Government Funding Programs*

**Summary of Pennsylvania State Biotech Funding Initiatives**

| Name | Type | Size of Invest-ments | Total Disburse-ments | Co-investor match | Biotech Specific | State Specific | Other | Source of Funding | Manage-ment |
|---|---|---|---|---|---|---|---|---|---|
| Biotechnology specific Venture Capital Fund | VC | N/A | Expects to total $240 - $260 w/ govt. contribution = $60 million | No | Yes | Yes | Program very new | State Budget; Tobacco Funds | Still under develop-ment |
| PA Early Stage Partners | VC | Range $100K - $7 mil | $50 Million | No | No | Yes | | Public / Private; Annual | Private |
| PA Early Stage II | VC | Range $100K - $7 mil | $101.5 Million | No | No | Yes | | Public / Private; Annual | Private |
| PA Technology Investment Authority | Loans / VC | $250K to $1 Million | Approx $18 Million | | No | Yes | | Public / Private; Annual | Private |
| Ben Franklin Technology Partnership (BFTP) - Innovation Investments Fund | Loans / Warrants | Up to $100K | N/A | No | No | N/A | | State Budget; Annual | Private |

| Name | Type | Size of Invest-ments | Total Disburse-ments | Co-investor match | Biotech Specific | State Specific | Other | Source of Funding | Manage-ment |
|---|---|---|---|---|---|---|---|---|---|
| BFTP - Emerging Company Investments | Loans / Warrants | Range $101K - $250K | N/A | No | No | N/A | | State Budget; Annual | Private |
| BFTP - Emerging Plus Investments | Loans / Warrants | Range $251K - $500K | N/A | No | No | N/A | | State Budget; Annual | Private |
| BFTP – Technology Improvement Fund | Loans | Range $50K - $250K | N/A | Yes – 2:1 | No | N/A | | State Budget; Annual | Private |
| Ben Franklin Competitive Fund | Loans | Up to $25K | N/A | N/A | No | N/A | | State Budget; Annual | Private |
| Innovation Investment Fund | Convertible Loans | Up to $100K for prototype dev.; Up to $300K for Commercialization; Total investment potential is $1.1 million. | N/A | N/A | No | N/A | | State Budget; Annual | Private |
| Technology Commercialization Fund | N/A | Range between $100K to $250K | N/A | Yes – 1:1 cash; 2:1 anything else | No | N/A | | State Budget; Annual | Private |
| Ben Franklin Gateway partners of Southeast PA | Loan Assistance Program | Guarantees range from 25% to 50% of loan total which may range from $100K to $3 million | -- | -- | -- | -- | See text for details | State Budget; Annual | Private |

a. Government Supported Venture Capital

Pennsylvania has set aside $60 million of its *tobacco settlement* for a *biotechnology specific venture capital fund*. The government expects the initial investment to attract an additional $180 million to $200 million of co-investments in Pennsylvania based biotech companies. The Pennsylvania Public School's Employees' Retirement System (PSERS) has committed $60 million to the fund. Since the fund is currently under development, no information is available about disbursements or return on investments. Pennsylvania has also earmarked $100 million from the tobacco settlement monies for the development of three *Life Sciences Greenhouses* in

Pittsburgh, Philadelphia and Central Pennsylvania. This project is reportedly in its final stages of development.

*Pennsylvania Early Stage Partners* is a family of venture funds that makes investments in seed, start-up, and early stage technology-based companies. PA Early Stage's first fund was launched in January 1998, and it represented a unique collaborative effort between the Commonwealth of Pennsylvania, the $44 billion PSERS, and Safeguard Scientifics, Inc. Safeguard Scientifics is a leader in developing and operating growth technology companies. The $50 million fund was created specifically to achieve superior investment returns, while enhancing the image, motivation and environment needed for a technology-intensive commercial economy. The fund has enjoyed several successes to date, having invested in 25 portfolio companies -- six of which have had either a public offering or have been acquired -- while several other companies have had significant valuation increases since the initial investment.

*Pennsylvania Early Stage II* began operation in February 2000 with $101.5 million under management. Founding investors, PSERS and Safeguard Scientifics, along with two other strategic limited partners, provided the capital for Fund II. The fund is thriving and continues to focus on seed, start up and early stage technology - based companies with exciting growth prospects.

b. Government Grants and Loans

The *Pennsylvania Technology Investment Authority (PTIA)* is a state-established non-profit organization that is run by the Department of Economic Development Financing Authority. PTIA's loan program provides direct investment to or on behalf of technology-oriented businesses located in or maintaining a substantial operating presence in Pennsylvania. The loan program is broken up into three categories: the *Investment Fund*, the *University Fund* and the *E-Commerce Fund*. All investments made under this program have been direct investments to companies and to venture capital funds for further investing, although there has been no specific allocation for biotechnology investments. The funds that the PTIA uses are allocated from the Treasury and appropriation has been approximately $10 million annually per category since the program's inception. The state budget shows that for fiscal 2001, PTIA was apportioned a total of $30 million for its program.

PTIA has been in operation for two fiscal years and the amounts typically loaned out are typically are between $250,000 to $1 million, totaling approximately $5.6 million in FY 1999 and $12.2 million in FY 2000. PTIA provides only second round financing to companies which are already being funded by other state, federal, or private sources, and it has a cap of 20% of the total project. The largest loan was $2 million made to the same company for each fiscal year. These funds have all gone to private investments, although PTIA plans to target venture capital investments totaling $3 million per year

The Pennsylvania General Assembly created the *Ben Franklin Technology Partnership* in 1982 to promote technological innovation in the Commonwealth. The Ben Franklin Partnership

operates through four independent, non-profit corporations established in different regions of the state. They are:

1. Ben Franklin Technology Partners of Central and Northern Pennsylvania based in University Park
2. Northeast Tier Ben Franklin Technology Partners based in the Lehigh Valley
3. Ben Franklin Technology Partners of Southeastern Pennsylvania based in Philadelphia
4. Innovation Works, formerly known as the Ben Franklin Technology Partners of Western Pennsylvania, based in Pittsburgh.

Each regional center has a board that oversees all operations, with one central state board making most of the final decisions for all regions. The Ben Franklin Partnership provides funding through a number of different programs. The maximum cumulative investment in any individual company through all Ben Franklin investment programs is $500,000. Since its creation, the Ben Franklin Technology Partnership has received an average of approximately $32 million per year in funding from the State Budget. The Partnership was appropriated $56.4 million in funds from the state's 2001-2002 State Budget. The statewide coordinator of the Partnership informed E&Y that the Southeast region of Pennsylvania has seen the most biotechnology activity and investments.

BFTP's *Innovation Investment Fund, Emerging Company Investments* and *Emerging Plus Investments* programs provide funding for 6 to12 month projects in the form of a note and a detachable warrant. The note carries an interest rate of 12.5%, with the principal paid as a balloon payment with all unpaid interest at the end of the eighth year. The detachable warrant is an option to purchase common stock in the company at a nominal price after a future transaction results in the transfer of 20% or more of the company's equity (on a fully-diluted basis) to a third party.[6] In addition, Ben Franklin takes a security interest in the technology developed during the project. All three programs require applicant companies to provide matching funds, which must be at least equal to the amount of funding requesting from Ben Franklin. The three programs differ in the type of company and activity funded, and in the amount of funding provided.

The *Innovation Investment Fund* provides seed capital for product development leading to commercialization. The principals of a company typically finance proof of concept or early product development. These resources are often not sufficient to develop the product or process to the stage where it can attract investors or strategic partners, or demonstrate the likelihood of technical and commercial success. The Innovation Investment Fund helps to bridge this gap between the development stages and the stage where the product is ready for commercialization. Projects must include both technical and commercialization activities. Investment recipients are development-stage Pennsylvania companies that typically have neither a complete management team nor a prototype and/or final product. Companies are expected to have completed significant

[6] In addition, quarterly payments are made on the note at the lesser of 3% of total company revenues for the quarter, or accrued interest. Payments made in amounts less than cumulative accrued interest are rolled over to the next quarter. Repayment begins in the first fiscal quarter after completion of the funding period. No interest accrues during the funding period. Similarly, no payments are due during this period. Companies will repay no more than two times the amount of the Note (excluding warrant value). Companies have the option to limit the amount of repayment by prepaying their obligation.

market research and to have developed at least a preliminary market strategy. The total of a company's Innovation Investments may not exceed $100,000.

The *Emerging Company Investments* program provides seed capital for product commercialization and/or process development to companies demonstrating technical and market feasibility. The companies are required to have taken significant steps toward commercial success, such as intellectual property protection, alpha- or beta-testing, third party investments or strategic alliances. Companies funded under this program are typically development-stage Pennsylvania companies that have a management team, a completed prototype and/or product, and an appropriate marketing strategy based on significant market research. Investments range from $101,000 to $250,000.

The *Emerging Plus Investments* program provides later-stage seed capital for product commercialization and/or process development to companies that have demonstrated technical and market feasibility, and in most cases, to have already raised funding from another "smart-money" source. The largest of these investments will likely take the form of participation with venture capital and/or angel investors. In this case the investment may be structured on the same or similar terms as the larger funding round. As with Emerging Company Investments, this program requires companies to have taken significant steps toward commercial success. Investment recipients are typically development-stage Pennsylvania companies that have a management team, a completed prototype and/or product, and an appropriate marketing strategy based on significant market research. Emerging Plus Investments range from $251,000 to $500,000.

BFTP's *Technology Improvement Fund* provides financing in the form of a loan and possible royalty payment on sales, for research, development and commercialization activities. The fund provides research and development capital needed by established technology companies to maintain or enhance their competitive position. Eligible companies must have at least $2 million in annual sales, and be located in the southeastern Pennsylvania area. The fund requires a match of at least 2:1 from the company requesting the loan. Investments from the Technology Improvement Fund range from $50,000 to $250,000, and are disbursed as eligible costs are incurred. Repayment is based on the commercial success of the product or process developed. The repayment has two components: a minimum amount equal to the amount of the loan, payable in equal quarterly installments over five years at an interest rate equal to the Prime Interest Rate less 1%, and an additional amount equal to a 3% royalty on product sales up to 50% of the investment.[7] In addition, Ben Franklin will take a security interest in the technology associated with or developed during the project.

The *Ben Franklin Competitive Edge Fund*, established in 1993, provides loans and technical assistance available to small, "credit challenged" businesses in several Pennsylvania counties. The U.S. Small Business Administration supports the program under Grant: SB-OFA-93-012-01. This fund is designed to help entrepreneurs who might encounter financing challenges due to

[7] The minimum amount is payable even if the product or process funded by Ben Franklin does not result in sales. The minimum amount plus the product royalty are payable if the product or process resulting from the project generates sales. In no event will the company pay more than 1.5 times the principal amount of the loan (excluding application fee, late charges, etc.).

negative credit reporting or insufficient or unstable income. Loan sizes are up to $25,000 for existing and start-up businesses. The interest rate used is the Prime Rate plus 2%, capped at 10%, with the term of the loan being a maximum of 6 years.

*Innovation Works* (formerly known as the Ben Franklin Technology Partners of Western Pennsylvania) of Southwestern Pennsylvania is a regional development company whose focus is on early-stage high tech companies in Southwestern Pennsylvania. Funding is provided mostly by BFTP; local foundations provide additional funding. The main industries covered are the biotechnology, robotics, information technology, and telecommunications industries. Innovation Works was formed in 1999 and has received approximately $5 million annually in state funding.

Innovation Works' *Innovation Investment Fund Program* provides convertible loans to companies for the following amounts:

- Innovation Investments: up to $100,000 for prototype development or proof of concept; and
- Commercialization Investments: up to $300,000 for developing a prototype into a commercially viable offering.

Repayment terms are generally five years at 8%. A company can receive up to three Innovation Investments of up to $100,000 each; with the latter two investments not requiring the company to go through the formal process again. Innovation Works may also offer to make equity investments of up to $500,000 in existing portfolio companies when those companies receive additional equity funding from other institutional sources. There is a potential for companies to receive up to $1.1 million from Innovation Works through five investment stages. This program is not to be confused with BFTP's Innovation Investment Fund.

c. Other Government Funding

*The Technology Commercialization Fund* provides seed level funding for the commercialization of technology discovered and licensed by universities or research institutions in order to facilitate the creation, growth or attraction of for-profit commercial enterprises located in or relocating to southeastern Pennsylvania. Matching funds are required at a minimum of twice the amount requested from Ben Franklin, although if the match is provided in cash, the matching ratio can be reduced to 1:1. The size of the investments is typically between $100,000 and $250,000.[8]

Investments, however, may require warrants and, when venture capital participation is present, may take the form of equity. In the event that the venture is unsuccessful, Ben Franklin Technology Partners of Southeastern Pennsylvania (BFTP/SEP) and the university/institution will work together for a period of one year in an effort to make the technology productive. Failing that, Ben Franklin will retain residual rights to receive up to three times its investment in the event that the technology is subsequently licensed or commercialized. Ben Franklin will take a security interest in the technology associated with or developed during the project.

[8] Funding in excess of $100,000 can be obtained only with the participation in the project of a recognized venture capital firm or active sophisticated investor with a sound history of investing in the subject industry and a demonstrated commitment to company formation in the region.

*Ben Franklin Gateway Partners of Southeast Pennsylvania (Gateway Partners)* is a loan-facilitating program launched in March 2000 as part of Governor Ridge's technology initiatives through the PTIA. Gateway Partners is a partnership of BFTP/SEP, several commercial banks and selected local economic development providers from Southeastern Pennsylvania. The partnership assists early stage technology companies seeking soft asset financing, including leasehold improvements, furnishings, office equipment, and other items typically associated with working capital. [9]

Commercial bank members of Gateway Partners (Commerce Bank, Pennsylvania Business Bank, Progress Bank and Silicon Valley Bank) that lend to early stage technology companies can obtain loan guarantees ranging from 25% to 50% of the amount financed from Gateway Partners.[10] The amount financed can range from $100,000 to $3 million. The technology company and lender pay an annual fee to Gateway Partners for the guarantee (1.5% per annum on the guaranteed portion of the financing) and the lender agrees to provide a pro rata share to PTIA of any warrant or other equity mechanism taken as a condition of the financing. Loan guarantees are reviewed by the Gateway Investment Committee, and if approved, are issued by BFTP/SEP.

The funds for the guarantee pool come from the requested PTIA investment, plus $500,000 from BFTP/SEP. The economic development providers may also contribute to this pool. The PTIA investment is provided as a line of credit, so that the funds would be disbursed to the partnership only upon a call of the guarantee. Until that time, the funds remain in the PTIA fund.

[9] These "early stage technology companies" have typically received a first round (approximately $1 million) of venture capital, or have raised at least $500,000 of outside equity from active, private angel investors or personal and family assets.

[10] The percent guaranteed depends on the total amount and purpose of the financing. For Soft Asset Lending, the guarantee is 50% for the first $500,000 lent, and 25% for amounts over $500,000. For Leasehold Financing, if the company borrows up to $750,000, the guarantee is 25% of the loan amount, and if the company borrows over $750,000, the guarantee is $375,000 plus 25% of loan amount in excess of $750,000. For Bridge Financing, if a company borrows up to $750,000, guarantee is 50% of the loan amount; and is 25% of the loan amount if a company borrows over $750,000.

## Virginia

### *1. Private Venture Capital*

**Virginia Biotechnology Industry Private Venture Capital Funding**
**Dollars in Millions**
***(Number of Financings in Italics)***

| | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | Total |
|---|---|---|---|---|---|---|---|---|
| Biotech Venture Capital Raised | $6.3 M | $8.7 M | $0.0 M | $21.8 M | $9.6 M | $50.0 M | $45.0 M | $141.4 M |
| *Biotech Number of Financings* | *1* | *1* | *0* | *2* | *1* | *5* | *2* | *12* |
| All Industries VC Raised | $100 M | $493 M | $382 M | $600 M | $1,548 M | $2,753 M | $307 M | $6,183 M |
| Biotech VC / Total VC | | | | | | | | 2% |

Source: Venture Capital and Number of Financings data from VentureSource's VentureOne database. Compilation by Ernst & Young LLP. Estimates are for calendar years shown, except 2001 through Fall 2001. Biotech Venture Capital Raised shows private sector financings of biopharmaceutical companies headquartered in Virginia. Financings include those from professional venture capital firms, corporate investors and other private sources, but exclude funds from government sources. Financings also exclude public offerings, acquisitions and buyouts. All Industries VC Raised data is from National Venture Capital Association / VentureExpert.

### *2. Government Funding Programs*

**Summary of Virginia State Biotech Funding Initiatives**

| Name | Type | Size of Investments | Total Disbursements | Co-investor match | Biotech Specific | State Specific | Other | Source of Funding | Management |
|---|---|---|---|---|---|---|---|---|---|
| Virginia Small Business Financing Authority (VSBFA) Tax-Exempt Industrial Development Bond | Loan | Max $10M availability subject to state bond caps | N/A | No | No | Yes | | State Budget; Annual | State |
| VSFBA Taxable Industrial Development Bond | Loan | Minimum project size is $750K | N/A | No | No | Yes | | State Budget; Annual | State |
| VSFBA Umbrella Bond Program | Loan | N/A | N/A | N/A | N/A | N/A | | State Budget; Annual | State |
| VSFBA Loan Guarantee Program | Loan Guarantee | N/A | N/A | N/A | N/A | N/A | | State Budget; Annual | State |

| Name | Type | Size of Invest-ments | Total Disburse-ments | Co-investor match | Biotech Specific | State Specific | Other | Source of Funding | Manage-ment |
|---|---|---|---|---|---|---|---|---|---|
| VSFBA Capital Access Program | Loan Guarantee | N/A | N/A | N/A | N/A | N/A | | State Budget; Annual | State |
| VSFBA Economic Development Revolving Loan Fund | Loan | N/A | N/A | N/A | N/A | N/A | | State Budget; Annual | State |
| Center for Innovative Technology (CIT) Challenge Awards | Grant | $30,000 to $90,000 | N/A | Yes | No | Yes | | State Budget; Annual | Private |
| CIT Innovation Awards | Grant | Up to $30,000 | N/A | Yes | No | Yes | | State Budget; Annual | Private |
| CIT SBIR/STTF Proposal Assistance Awards | Grant | Up to $5,000 | N/A | Yes | No | Yes | | State Budget; Annual | Private |
| CIT Specialized Resource Awards | Grant | N/A | N/A | No | No | Yes | | State Budget; Annual | Private |
| Commonwealth Technology Fund (CTF) Strategic Institutional Enhancement Program | Grant | $500K to $1,5 mil | $13 million total for the three CTF Programs | Yes | No | Yes | | Private | University |
| CTF Industry Inducement Program | Grant | $500K to $1 mil | $13 million total for the three CTF Programs | Yes | No | Yes | | Private | University |
| CTF Matching Funds Program | Grant | $500K to $1 mil | $13 million total for the three CTF Programs | Yes | No | Yes | | Private | University |

a. Government Supported Venture Capital

No government supported venture capital programs were identified.

b. Government Grants and Loans

The *Virginia Small Business Financing Authority*, staffed by the Financial Services division of the Virginia Department of Business Assistance, was created in 1984 with passage of the Virginia Small Business Financing Act. In addition to being a statewide issuer of industrial

development bonds, VSBFA is the conduit through which the Department of Business Assistance provides financial assistance to Virginia's businesses. VSBFA's goal is to promote Virginia businesses by increasing access to capital through the creative application of public and private financing, thereby maximizing employment opportunities and investment throughout the Commonwealth.

Creditworthy companies seeking to finance industrial and commercial facilities can obtain long-term financing at favorable interest rates and terms through the *VSBFA Industrial Development Bond (IDB)* programs. IDBs provide companies with an important alternative to conventional financing of manufacturing projects.

The *Tax-Exempt Industrial Development Bond Program* makes funds available for the acquisition, construction or expansion of manufacturing facilities statewide. Restricted to manufacturing facilities and qualifying "exempt" facilities only and must meet federal code requirements for eligibility. Maximum project size is $10 million and the availability of bonds is subject to state bond volume caps.

The *Taxable Industrial Development Bond Program* is available for non-manufactured projects and other projects ineligible for tax-exempt funding. The minimum project size is $750,000 and there is no maximum project size.

The *Umbrella Bond Program* is a placement option available for tax-exempt bonds issued by VSBFA that minimizes closing and issuance costs; thereby, lowering the project size threshold for bond financing.

The *Loan Guarantee Program* is designed to assist Virginia's small businesses in obtaining the short terms financing they need to improve and expand their operations and thereby create new job opportunities within the Commonwealth. Businesses benefits by getting financing for which they would not normally qualify.

The *Virginia Capital Access Program* provides access to capital for businesses by encouraging banks in Virginia to make loans that they would otherwise not make due to a borrower's riskier profile.

The *Economic Development Revolving Loan Fund* provides loans to manufacturing companies or other industries which derive 50% or more of their sales outside VA.

The *Center for Innovative Technology (CIT)* was created by the General Assembly of Virginia in 1984 as a nonprofit organization designed to enhance the research and development capability of the state's major research universities. In its first decade, CIT implemented that original legislative intent by bringing Virginia businesses and institutions of higher education into relationships that promote a climate of cooperation and technological innovation. CIT has an internal Technology Awards Program that supports both technology development by Virginia companies, and technology infrastructure for Virginia industry.

The *CIT Challenge Awards* are intended to support applied research or development projects for technologies that are approximately 2 to 3 years from commercialization. The company must provide cash support for the project at a minimum of 50% of the amount requested from CIT if it is a small company (under 500 employees). The percentage is 100% if it is a large company. If the technology developed under a CIT Challenge Award is commercialized, the company must provide a financial return to CIT based on net revenues associated with the technology, capped at a maximum liability of two times the award amount. If the technology is not commercialized or otherwise implemented by the company, no return is due. The Awards range from a minimum of $30,000 to a maximum of $90,000, and funding is expected to cover a one-year period.

The *CIT Innovation Awards* are short-term, modest awards intended to support the financial development phase of a technology product or process. The emphasis is on supporting efforts necessary to commercialize a new or improved product or to finalize and implement an internal process that will result in cost savings or productivity improvements for the company within about 18 months of the completion of the project. The company must provide cash support for the project at a minimum of 50% of the amount requested from CIT if it is a small company (under 500 employees). The percentage is 100% if it is a large company. The Awards are for amounts of up to $30,000. Innovation Awards and funding provided is for a period of approximately 6-9 months.

The *SBIR/STTR Proposal Assistance Awards* provide incentive to small, high-tech firms from across the State to submit SBIR/STTR proposals. The awards help to pay for the expense of proposal preparation. Any Virginia company that meets the Federal SBIR/STTR eligibility requirements and has not received more than 2 Phase I awards (if applying for Phase I assistance) or not received more than 2 Phase II awards (if applying for Phase II assistance). Matching support is required in cash or in-kind contributions such as staff time, which demonstrate strong commitment to the project. Support will be provided up to a maximum of $5,000 with one award per fiscal year per company.

The *Specialized Resource Awards* are for Virginia based companies that have an immediate, short-term need, the solution to which will result in improving the company's competitiveness in the short term. The company must provide a minimum of 50% of the amount requested if it is a small company (under 500 employees) and 100% if it is a large company.

In the *Report of the Joint Commission on Technology and Science to the Governor and the General Assembly of Virginia*[11], Jerald Coughter, Industry Director for the CIT, presented the results of the biotechnology venture capital program study requested by the commission in the 2000 Session of the General Assembly. The study was done to study the feasibility of establishing a state-sponsored venture capital program, tailored to the biotechnology industry. Maryland, North Carolina, Connecticut, and Ohio were among the states that were studied. In Maryland, the programs mentioned were the *Maryland Enterprise Investment Fund* and the *Challenge Investment Programs.* The Committee decided to recommend that the Commission consider a bill that would create a state-sponsored venture capital program specifically tailored

[11] Source: Report Of The Joint Commission On Technology And Science To The Governor And The General Assembly Of Virginia, Commonwealth Of Virginia, Richmond 2001
http://jcots.state.va.us/documents/hd63_01htm#IIIC

towards biotechnology. This program would be based on the Ohio model. The *Ohio BioVentures Development Corporation* is an SBIC. The Program's investments are not limited to companies within the State of Ohio. The fund began started with $750,000 that was invested by the State of Ohio, $15 million from private sources, and $30 million from the SBA. Ohio BioVentures plans $500,000 investments in up to 45 companies with half of them receiving an additional $1 million. Upon reaching a positive cash flow, the companies will first pay the SBA back for its investment up to a capped 14% rate of return. This program has no geographic restrictions, and it is expected to invest in other regions to establish a network of potential co-investors for Ohio-based deals. While the Committee agreed that even though such a bill should start the program this year, it need not appropriate money. The funding issue will be revisited next year.

c. Other Government Funding

The Governor and General Assembly Of Virginia created the *Commonwealth Technology Fund (CTRF)* in 2000. The purpose of the fund is to attract public and private research funding for institutions of higher learning in order to increase technological and economic development in the Commonwealth of Virginia.

The fund has three components, with the core component being the *Strategic Institutional Enhancement Program* that has the purpose of upgrading the research capacity of academic departments or units that have demonstrated the ability to perform innovative research with strong potential to contribute to economic development in the Commonwealth.

The programs that complement this are the *Industry Inducement Program and the Matching Funds Program.* The Industry Inducement Program was designed to upgrade universities' research capabilities in order to attract specific companies to expand or locate in Virginia. Dollar for dollar matching funds are required for this program but this may be waived for good cause. The Matching Funds Program is for the provision of matching funds to leverage federal and private research investment in Virginia universities. The Fund is administered by the Department of Planning and Budget (DPB) and the Virginia Research and Technology Advisory Commission (VRTAC) will do the evaluations and make the recommendations required. Each program offers amounts of funding between $500,000 to $1 million ($1.5 million for the Strategic Institutional Enhancement Program) and the period of the award can be from one to three years. Initial funding for the three programs was $13 million from the General Fund, and was appropriated in Central Accounts, under the Economic Contingency budget item (Item 548) in the 2000 Appropriation Act. The appropriation also includes $13 million in non-general funds, representing dollar for dollar matches the institutions will be expected to provide.